

POPULAR MECHANICS

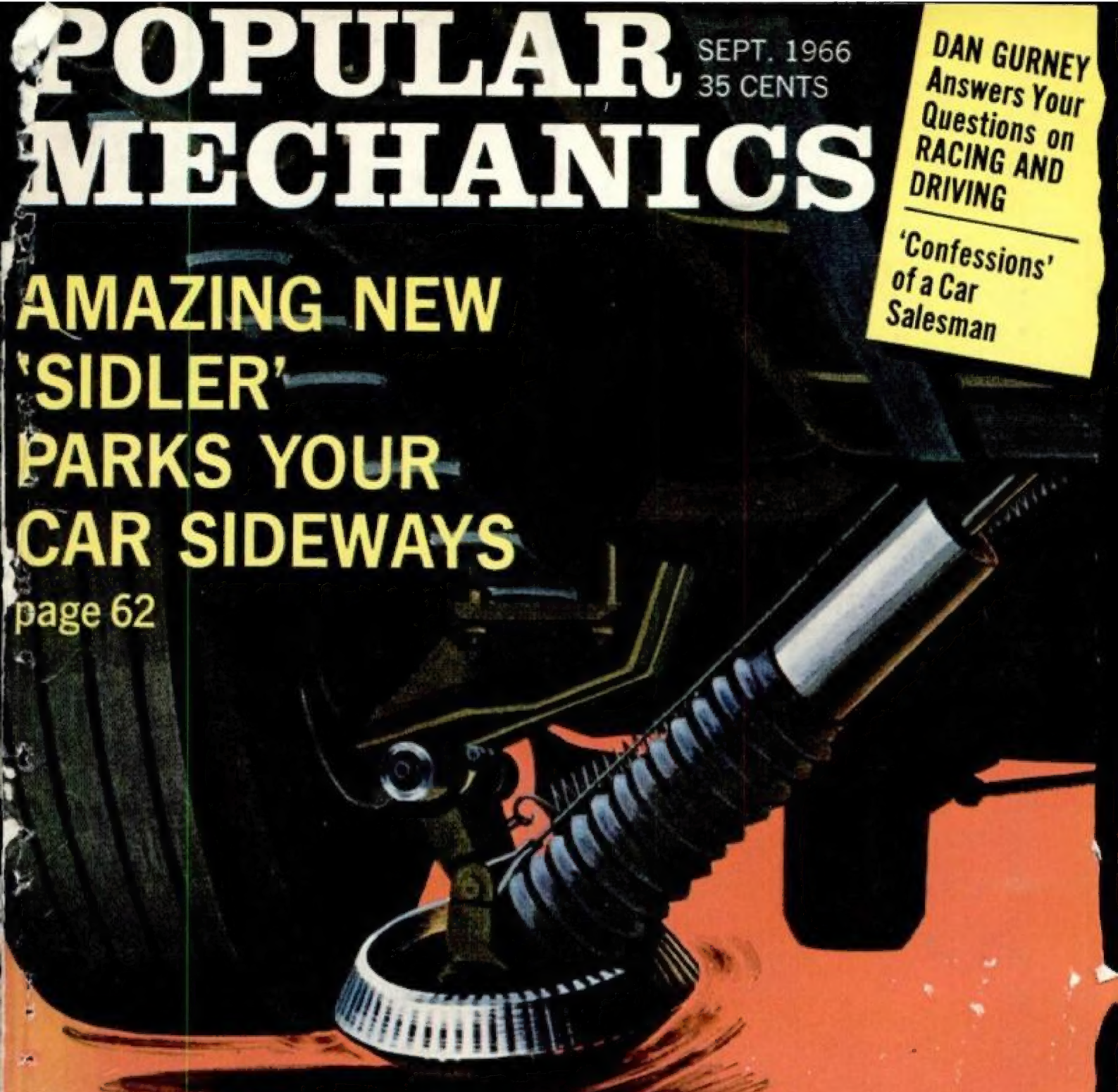
SEPT. 1966
35 CENTS

DAN GURNEY
Answers Your
Questions on
**RACING AND
DRIVING**

'Confessions'
of a Car
Salesman

**AMAZING NEW
'SIDLER'
PARKS YOUR
CAR SIDEWAYS**

page 62



BIG 42-PAGE HOME REMODELING SECTION
Before-and-After Bathroom... Swing-Down Kitchen Cupboards
The Fanciest Bar You Can Build... Wife-Saving Sewing and
Laundry Centers... 11 Weekend Projects

**PLUS: TEAR-OUT-AND-SAVE CARD OF
MOST-NEEDED REMODELING MEASUREMENTS**

**EXCLUSIVE FOR PM READERS! PREVIEW OF GREAT IDEAS
AND GADGETS FROM THE WORLD'S BIGGEST INVENTORS SHOW**

What Those 600-Passenger Airliners Will Be Like • Also PM Auto Clinic and Saturday Mechanic

Материал, защищенный авторским правом



**This is a GM Original:
It works well under pressure.**



**This is a GM Replacement:
It can take pressure, too.**

Everything you can say about GM Originals you can say about GM Replacements. Because they're identical in every way.

That's true of the wheel brake cylinder, which has to withstand tremendous pressures, or any other part for that matter.

Genuine GM Parts, in GM and United Delco packages, always give you this assurance. So always go where they use them. Reminder: Now's a good time to have another of those regular safety checks.

GENUINE GENERAL MOTORS PARTS



CHEVROLET • PONTIAC • OLDSMOBILE
BUICK • OPEL • CADILLAC • GMC TRUCKS

United
Delco



**Did we
get the
business?**

**You bet
we did.**

This One



50Z3-HWK-K2G4

From 32 top hardware and building
supply advertisers who participated
in our big September Remodeling blast.

The Andersen Corp.
Arrow Fastener Co. Inc.
Benjamin Moore & Co.
The Borden Co.
Burgess Vibrocrafters, Inc.
Channellock, Inc.
Comark Plastics
DAP, Inc.
Daubert Chemical
Dremel Mfg. Co.
Fayette R. Plumb, Inc.
General Electric
Homasote Co.
Hyde Mfg. Co.
E. I. DuPont deNemours & Co. Inc.
Insulite

Klean-Strip Co., Inc.
Masonite Corp.
Millers Falls Co.
Pierce & Stevens Chemical Corp.
Portable Electric Tools
The Ridge Tool Co.
The Savogran Co.
Simpson Timber Co.
Skil Corp.
Swingline
United Shoe Machinery
U. S. Plywood Corp.
Weller Electric Corp.
Wells Mfg. Co.
Wen Products, Inc.
Woodhill Chemical Corp.

Look for their advertisements in this issue.

4,675,000

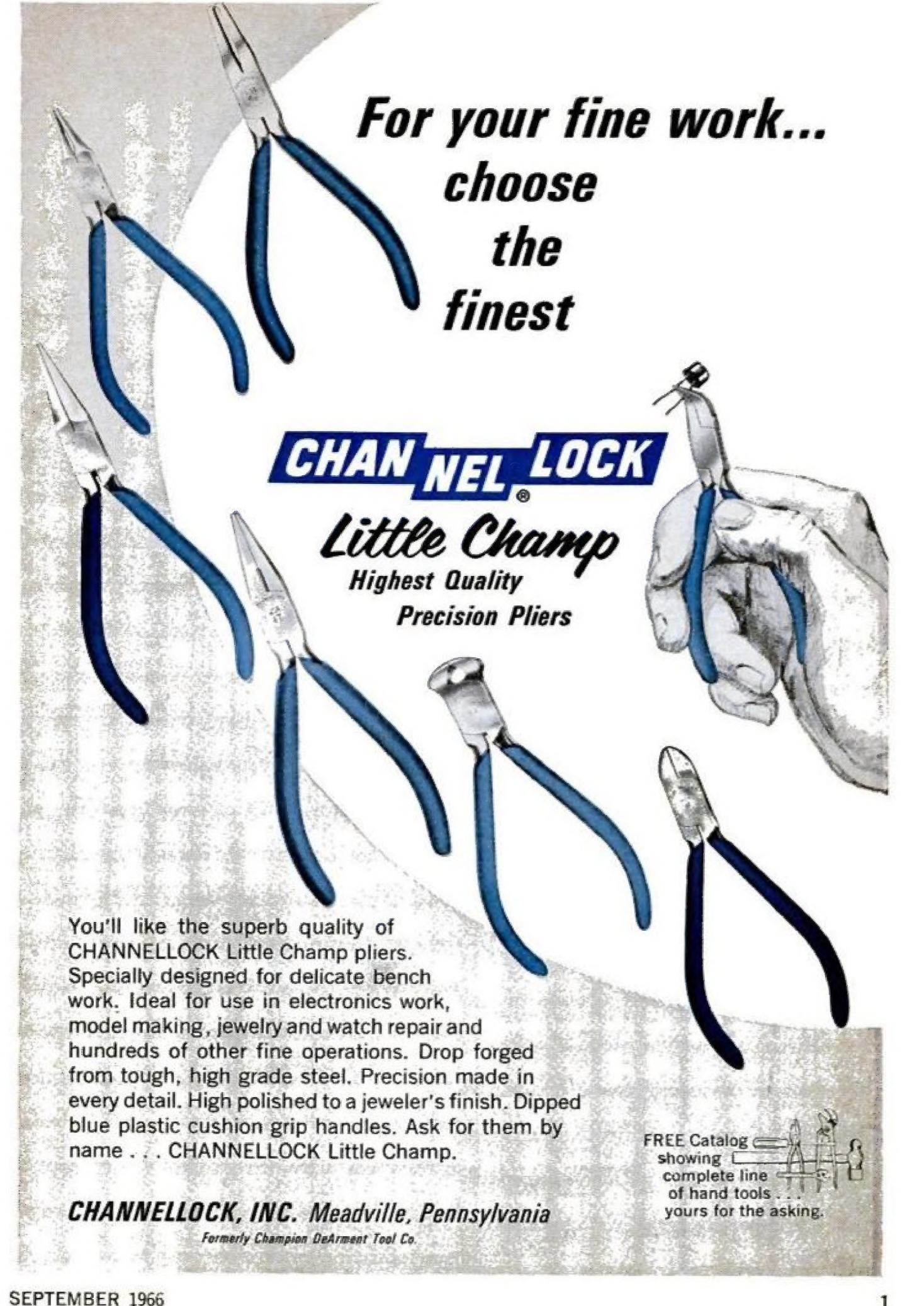
**POPULAR
MECHANICS**

men will!

September, 1966

Popular Mechanics is published monthly in national and regional editions by The Hearst Corporation, 959 Eighth Avenue, New York, N. Y. 10019. Second-class postage paid at New York, N. Y. and at additional mailing offices. Subscription Price U.S.A. and possessions \$4.00 for one year, in Canada \$4.50 for one year.

Vol. 126, No. 3



***For your fine work...
choose
the
finest***

CHAN NEL LOCK®

Little Champ

Highest Quality

Precision Pliers

You'll like the superb quality of CHANNELLOCK Little Champ pliers. Specially designed for delicate bench work. Ideal for use in electronics work, model making, jewelry and watch repair and hundreds of other fine operations. Drop forged from tough, high grade steel. Precision made in every detail. High polished to a jeweler's finish. Dipped blue plastic cushion grip handles. Ask for them by name . . . CHANNELLOCK Little Champ.

CHANNELLOCK, INC. Meadville, Pennsylvania

Formerly Champion DeArment Tool Co.

FREE Catalog
showing complete line
of hand tools . . .
yours for the asking.



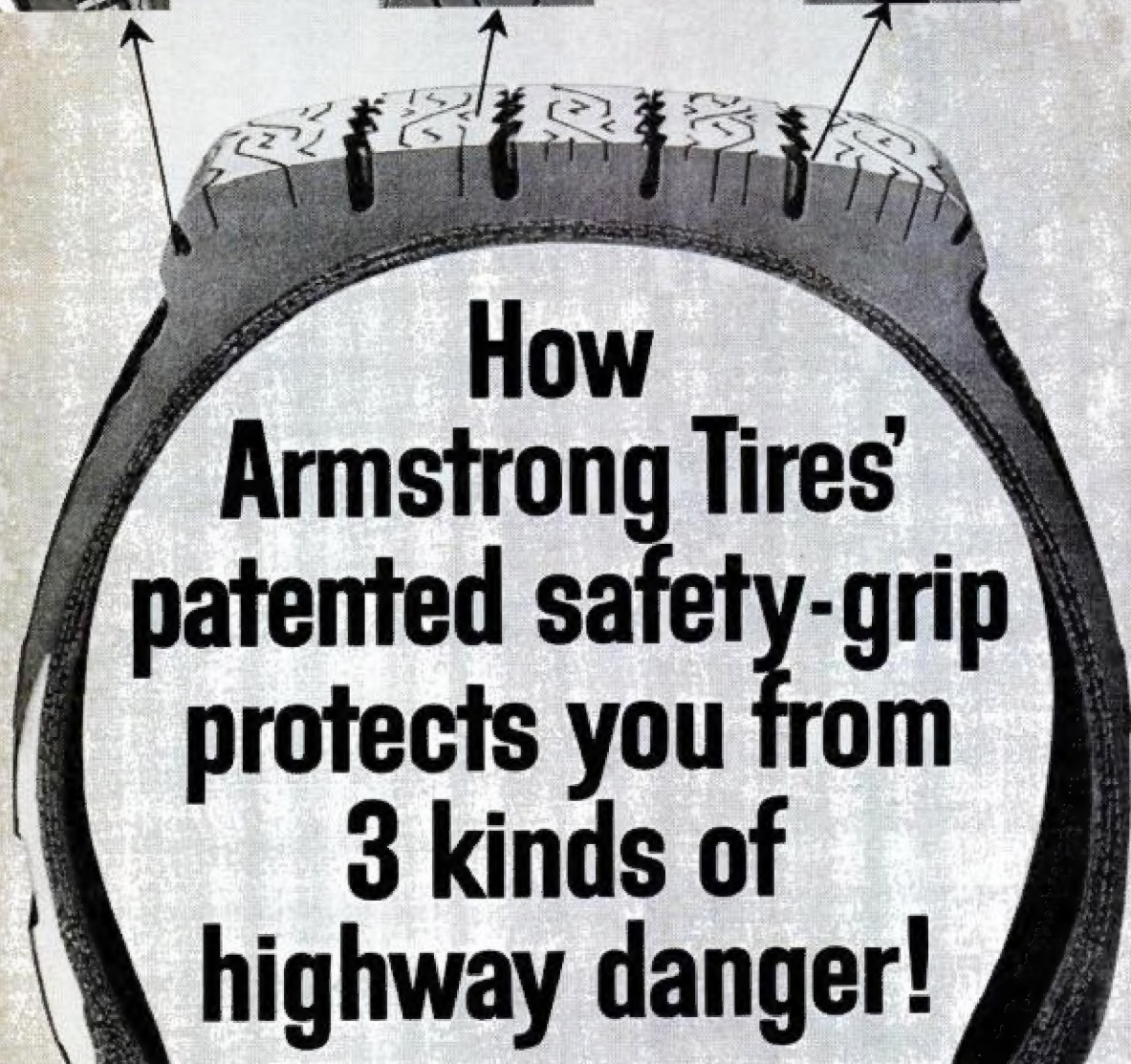
**1. SAFER
CORNERING**
with
Armstrong
Safety Outer
Ribs



**2. SAFER
PICK-UP**
with
Armstrong
Safety Sipes

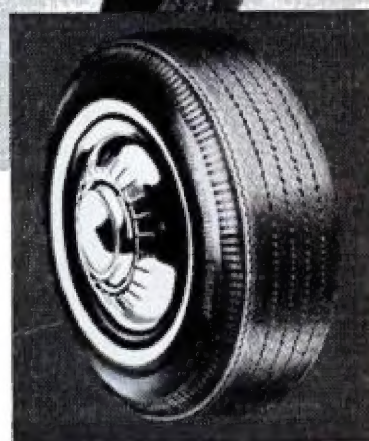


**3. SAFER
STOPS**
with patented
Armstrong
Safety Discs



How Armstrong Tires' patented safety-grip protects you from 3 kinds of highway danger!

In cornering, Armstrong's Safety Outer Ribs provide extra rubber to "lean on" for sway-free control. In acceleration, Armstrong's 30% deeper Safety Sipes add grip for instant traction. In emergency stops, patented Safety Discs keep tread ribs open, always ready to grip. Plus, the remarkable mileage of Rhino-Flex construction! See the Armstrong "Premium Coronet" at your nearest Armstrong Tire dealer, listed in the Yellow Pages.



ARMSTRONG The Safe Tire

The Armstrong Rubber Company
West Haven, Conn. • Des Moines, Iowa • Natchez, Miss. • Hanford, Calif.
Building Tires of Safety and Quality for Over Half a Century!



The air filters in Ford Motor Company cars remove particles much too small to see. Yet these filters breathe 10,000 gallons of air for every gallon of gas.

A car so precisely engineered can be cared for best by the specialist—your Ford or Lincoln-Mercury dealer.

See him and be sure.



Dealers' mechanics are provided training by factory experts. Dealers also have genuine parts, special equipment.



Only at Ford and Lincoln-Mercury dealers



POPULAR MECHANICS

INTERNATIONAL EDITIONS: AUSTRALIAN, SPANISH, CARIBBEAN, FRENCH, DUTCH, PORTUGUESE, DANISH, SWEDISH

AUTOMOBILES AND DRIVING

- [28 Detroit Listening Post](#)
- [36 Auto Clinic](#)
- [59 'Confessions' of a Car Salesman](#)
- [62 Just Point 'er In and Push the Button!](#)
- [86 Drivin' with Dan](#)
- [108 Saturday Mechanic: That Pesky PCV](#)
- [198 The Frantic Fitch Phantom](#)

SCIENCE AND INVENTIONS

- [13 New Inventions](#)
- [14 Science Worldwide](#)
- [70 7000 Better Mousetraps](#)
- [80 Computerburgers Hit Assembly Line](#)
- [100 The Music Goes Round and Round](#)

SHOP AND CRAFTS

- [43A Exciting New Products](#)
- [147 9 Novel Hinges—Can You Guess What They're For?](#)
- [154 6 Helpful Hints to Make Shop Work Easier](#)
- [160 AMT's New Price Bustin' Radial-Arm Saw](#)
- [162 Ohm's Law Chart](#)
- [163 Make This Unique Work-Holding Vacuum Plate](#)

HOME AND YARD

- [17 Homeowners' Clinic](#)
- [112 Home is What You Make It!](#)
- [112 11 Weekend Projects](#)
(Flagged for filing)
- [119 Adding a Window to a Panel Door](#)
- [120 Give Your Wife a Break](#)
- [121 Kitchen Laundry Wall](#)
(Flagged for filing)
- [124 Dormer Sewing Center](#)
- [126 Swing-Down Cupboards](#)
- [128 New Products for Home Remodeling](#)

- [132 Deluxe Bathroom for a Modest Home](#)
(Flagged for filing)
- [139 Build this "Wonderbar"](#)
(Flagged for filing)
- [144 Once a Grill Now a Fireplace](#)
- [145 Home Hints for PM Readers](#)
- [146 Fence "Turns on" to Light Front Walkway](#)
- [146 How to Light a Skylight—Without the Sun](#)
- [151 Add-On Bay Takes Load Off Garage](#)
- [152 Solving Home Problems](#)

AEROSPACE, AVIATION, MILITARY

- [57 Aviation Jetstream](#)
- [68 500 Eggs in one Basket](#)

ELECTRONICS, RADIO AND TV

- [96 Correspondence School by Radio](#)
- [166 Build this CB Intercom and Keep Track of Your Kids](#)
- [169 Build a 1-Transistor Autogen Radio](#)

BOATING, OUTDOOR RECREATION

- [21A What's New Outdoors](#)
- [102 He's Always Ready to Go Fishing](#)
- [156 What's the Truth About Fuel Mixes?](#)
- [159 Outboard Clinic](#)

JOBS AND CAREERS

- [24 Career Barometer](#)

REGULAR FEATURES

- [6 Letters to the Editor](#)

PHOTOGRAPHY

- [92 Adventures of an Underwater Cameraman](#)
- [155 New for Camera Buffs](#)

Cover painting by Ted Lodigensky

NEXT MONTH IN POPULAR MECHANICS

1967 Cars: The Showdown Year. 25 pages of all the new cars . . . the hot jobs . . . the middle-sized ones . . . the family sedans . . . and the fancy big ones.
The New Alaskan Gold Rush. There's still gold for everyone—from lone prospectors to big companies—in Alaska's waters. Here's where it's being found.

Published By The Hearst Corporation
RICHARD E. BERLIN, PRESIDENT

President, Magazines Division:
RICHARD E. DEEMS

Publisher:
JOSEPH F. KERN

Editor:
ROBERT P. CROSSLEY

Executive Editor:
RICHARD F. DEMPEWOLFF

Managing Editor:
JOHN A. LINKLETTER

Shop Crafts Managing Editor:
WAYNE C. LECKEY

| | |
|---------------------------|----------------------------|
| CLIFFORD B. HICKS | Midwest Editor |
| THOMAS E. STIMSON | Western Editor |
| WILLIAM KILPATRICK | Automotive |
| KEVIN V. BROWN | Aviation |
| ALFRED W. LEES | Home Workshop |
| RICHARD HOWE | Building and Landscape |
| ARTHUR MIKESELL | Boating |
| JOHN F. PEARSON | Science |
| STUART JAMES | Outdoors |
| BILL HARTFORD | Electronics |
| LEONARD SAMUELS | Photography, Shop Products |
| JOHN J. SHEAHAN | Production |
| TERRY HONIGFELD | Assistant Production |
| MURRAY COOPER | Assistant Art Director |
| LEO R. WEEKS | Assistant Art Director |
| GEORGE W. BLOW | Staff Artist |
| PHILIP H. HUY | Staff Artist |
| HILDA SUEN | Staff Artist |
| FRANK P. FRITZ | Chief Photographer |
| EUGENE A. COLANGELO | Staff Photographer |
| RALPH L. CLAAR | Photographer |
| GARRY WINTER | PM Books |
| FRANKLYN JACOBY, ASID/IDI | Design Consultant |
| EVERETT JOHNSON | Cabinetmaker |

ADDRESS ALL EDITORIAL COMMUNICATIONS TO: 575 Lexington Ave., New York, N.Y. 10022. For additional sources of information on the articles and products in this issue, write to Bureau of Information, Popular Mechanics, for free "Where-to-Find-It" list.

L. PARK BENJAMIN, Advertising Director

LAWRENCE T. GALE, Advertising Production Manager

ADVERTISING OFFICES: New York: 575 Lexington Ave., Murray Hill B-8500; Chicago: 520 N. Michigan Ave., 527-2400; Detroit: General Motors Bldg., TRinity 5-8711; Cleveland, Hanna Bldg., 1422 Euclid Ave., Prospect 1-0456; Los Angeles: 3460 Wilshire Blvd., DUNKirk 2-8458; San Francisco: 1101 Hearst Bldg., YUKon 2-0823.

SUBSCRIPTION SERVICE: Mail all subscription orders, changes of address, correspondence concerning subscriptions, and Postmaster notices of undeliverable copies to Popular Mechanics, Box 646, New York, N.Y. 10019.

Popular Mechanics is published monthly by The Hearst Corporation, 57th St. at 8th Ave., New York, N.Y. 10019, U.S.A. Richard E. Berlin, President; George Hearst, V-Pres.; Richard E. Deems, President of Magazines; John R. Miller, V-Pres. and Gen. Mgr. of Magazines; William S. Campbell, V-Pres. and Director of Circulation; Joseph F. Kern, V-Pres. for Popular Mechanics; Frank Massi, Treasurer; R. F. McCauley, Secy. Single copy in the United States and Canada, 35 cents. Subscription prices: United States and Possessions, \$4.00 for one year; \$7.00 for two years; \$10.00 for three years. Canada, add \$0.50 for each year. Pan American Postal Union countries, add \$1.00 for each year. All other countries, add \$2.00 for each year. When changing address, give old address as well as the new, with postal-zone number, if any, and allow six weeks for change to become effective. Second-class postage paid at New York, N.Y., and at additional mailing offices. Authorized as second-class mail by the Post Office Department, Ottawa, and for payment of postage in cash. Registered as second-class matter at the Post Office at Mexico, D.F., Mexico, June 20, 1950. © 1966 by The Hearst Corporation. All rights reserved. Printed in U.S.A.

SEPTEMBER 1966



How I retired in 15 years with \$300 a month

"Here's one retired Yankee who's fallen in love with Florida. I've begun a new life—all because of the check for \$300 I get each month.

"My retiring came out of a business trip to Tampa in 1950. I ran into Don Nelson, an old friend from New York. I thought he was on vacation, but he said he had retired!

"He told me he'd planned it for 15 years. He explained that he never could have retired on his investments or savings alone. He had a Phoenix Mutual Retirement Income Plan.

"Flying home, I noticed a Phoenix Mutual ad in a magazine. Sure enough, I could get a retirement income guaranteed for life if I started young enough. When I got home, I cut out the coupon and sent for more information. In a few days, a booklet came by mail. And there was exactly the Plan for me. If I started right then—at 40—I'd be able to retire in only 15 years with \$300 a month.

"I felt more and more secure as those 15 years went by. When my first check for \$300 arrived, I was off. Now that I'm settled, the real fun's just beginning."

Send for free booklet

You, too, can plan to have an added income of from \$50 to \$300 a month, or more, if you start early enough. Send the coupon and receive by mail a free booklet on this and other plans.

PHOENIX Retirement MUTUAL Income Plans

Phoenix Mutual Life Insurance Co., 236 American Row, Hartford, Conn. 06115. Please mail me, without obligation, your free booklet on retirement income plans.

Plan for Men ☐ Plan for Women ☐

Name

Date of Birth

Address

LETTERS

TO THE EDITOR

Dowsing, anyone?

We were very pleased with the excellent article, *Can You Find Water with a Forked Stick?* (page 88, July PM).

You mentioned the American Society of Dowsters, Inc. Your readers may be interested in knowing that the national headquarters is in Danville, Vt. 05828. Membership is open to all interested persons; yearly dues are \$5.

Danville, Vt.

HENRY P. BALIVET,
Secretary

We'll join—but first send us a forked stick that'll locate five bucks in an empty wallet.

Warner Brothers studio is built on an old dry river bed in Burbank, and you don't have to dig far to have a well anywhere in that area.

We were on a back lot, and the subject of water witching came up. One of the fellows cut a green forked stick, and we all tried it.

I have a pretty good grip. I held the darn thing as tight as I could, trying to keep the end from tipping down. Some of the green bark actually peeled off in my hands. I tried it again and again, and I simply could not keep the end of the stick from turning toward the ground.

Tarzana, Calif.

PAUL M. CALVERT

I challenge any engineer or geologist to say that I cannot differentiate large or small amounts of water in the earth by dowsing.

I can prove to anyone what direction the water veins run and prove if it is a large or small-volume water vein, even blindfolded!

Grants Pass, Ore.

MANVEL O. ANDERSON

Back to Los Angeles

I predict that you are going to hear from Dallas regarding the drawing on page 100 of your July issue (*The Man Who Can Move Mountains*).

You describe the building shown as the "tallest building in Dallas." I count only 16 stories with some sort of roof house. Citizens of that city are extremely proud of their skyline—some of the skyscrapers being over 40 stories high.

Corpus Christi, Tex.

C. G. INGLISH

On a clear day you can see that build-

ing very well—but, darn it, you have to be in Los Angeles. The building is the home office of the Signal Oil and Gas Co., it is 16 stories high, and it never was in Dallas.

Incidentally, that offshore drilling platform shown in the drawing is taller than a 30-story building—and that's 30 stories in Los Angeles or Dallas . . . or Kokomo . . . or Des Moines . . . or anywhere.

Maybe anchors will help

After reading *Car Stealing Made Simple!* (page 57, July PM), I'd like to add a line or two.

Many people leave their keys in the ignition lock at all times, and many turn the ignition only part-way off so that the engine stops but not far enough to keep the ignition from being turned on again with a pocket knife.

I have an idea that will stop all car stealing: Simply put a valve on the gas line that shuts off the gas with a key.

Evansville, Ind.

JAMES E. ARNOLD

Okay, but you'll never sell that idea to a woman. Imagine looking through a handbag for two keys instead of one! (Besides, how are you going to keep a thief from getting a copy of that second key, too?)

European cars are better

Congratulations on your reports on the new cars from Detroit's junkyard of supposedly new automobiles.

At present I'm stationed in Germany and have had ample opportunity to compare European automobile workmanship with that of Detroit. Needless to say, the European workmanship is far superior to Detroit's.

Thanks for a fine magazine. I like the way you call your shots as you see them. Keep up the pressure; insist on quality.

APO, New York M.SGT. HARRY H. ELKINS

Not the only one

In regard to *Dirty Cars Wanted* (page 66, June PM), Mr. Milstin has a very fine business, I know, for I've had such a business for five years. I know of several other such operations in the nation, so Mr. Milstin's isn't "perhaps the only mobile auto bathing business in the world."

Little Rock, Ark.

GERALD BINNS

7 ways to get out of a job rut

Which one of these high-pay fields do you want to prepare for at home, in your spare time?



ACCOUNTING

World's fastest-growing profession: income, security, prestige are today at an all-time high.



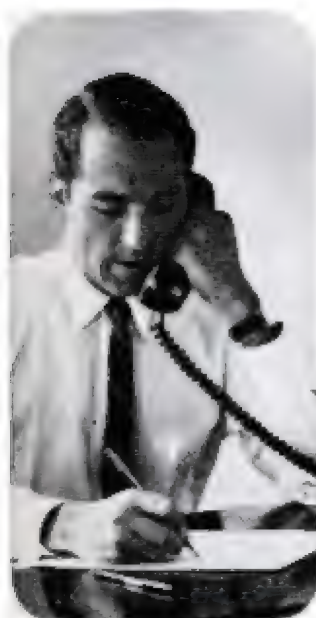
BUSINESS MANAGEMENT

Plenty of room at the top. Trained executives receive the highest salaries in business history.



DRAFTING

The gateway to opportunity in industry and engineering. Thousands of jobs waiting for skilled draftsmen.



TRANSPORTATION

Key job of today: traffic and transportation management — control of shipping by land, sea, air.



BUSINESS LAW

Essential training for the man who wants to get ahead in practically any field of business today.



STENOTYPE

Machine shorthand — world's newest, fastest shorthand — used at conventions, in courts, in business.



REAL ESTATE BROKERAGE

One of the most interesting and profitable careers in America today. Full or part time opportunities.

What do you need to get started toward a bright future in one of these desirable fields? Just ordinary ambition and the readiness to set aside a part of your leisure time for home study. This is exactly the way thousands of LaSalle students — men and women — have started toward success. LaSalle training, based on more than half a century's experience, is available to all, regardless of age, present occupation, or previous experience. And the cost is remarkably low. Mail coupon for free illustrated booklet describing the subject of your choice. LaSalle, 417 South Dearborn, Chicago, Illinois 60605.

LA SALLE EXTENSION UNIVERSITY

A Correspondence Institution

417 South Dearborn Street, Dept. 87-104, Chicago, Illinois 60605

Please send me free illustrated booklet on the field I have checked below:

Name

Address

City & State..... Zip No.....

County..... Age.....

Occupation..... Working Hours..... A.M..... P.M.

- ☐ Accounting
- ☐ Business Law
- ☐ Business Management
- ☐ Drafting
- ☐ Real Estate
- ☐ Stenotype
- ☐ Transportation

ACCOUNTING

Accounting for Business
Programmers
Accounting (Canadian)
Auditing
Business Law
Cost Accounting
C.P.A. Review
Estate & Trust
Accounting
Executive Accounting
Federal Tax
General Accounting
Industrial Accounting
Junior Accounting
Legal Accounting
Office Accounting
Personal Income Tax &
Social Security
Practical Accounting
Public Accounting
Small Business
Accounting
Starting & Managing a
Small Bookkeeping
Service

**ARCHITECTURE
AND BUILDING**

Architectural Drawing &
Designing
Architecture
Building Contractor
Building Estimator
Building Inspector
Building Maintenance
Carpenter-BUILDER
Carpentry & Millwork
House Planning & Interior
Design
Mason
Painting Contractor
Reading Arch. Blueprints
Review in Arch. Design &
Practice
Review of Mech. Systems
in Buildings

ART

Amateur Artist
Commercial Art
Commercial Cartooning
Interior Decorating
Oil Painting for Pleasure
Show Card & Sign
Production
Show Card Writing
Sign Painting & Designing
Sketching & Painting

AUTOMOTIVE

Automatic Transmission
Specialist
Automobile Body
Rebuilding & Refinishing
Automobile Electrical
Technician
Automobile Engine Tune-Up
Automobile Technician
Automotive Mechanic
Diesel-Gas Motor Vehicle
Engines

BUSINESS

Advertising
Basic Inventory Control
Business Administration
Business Management &
Marketing
Business Management &
Production
Canadian Business Courses
COBOL Programming
Condensed Business
Practice
Direct Mail & Mail
Order Advertising
Industrial Psychology
Magazine & Newspaper
Advertising
Managing a Small Store
Marketing
Marketing Research
Modern Executive
Management
Office Automation
Office Management
Programming for Digital
Computers
Programming the IBM 1401
Computer
Purchasing Agent
Retail & Local Advertising
Retail Business
Management
Retail Merchandising
Retail Selling
Systems and Procedures
Analysis

CHEMICAL

Analytical Chemistry
Chemical Engineering
Chemical Engineering Unit
Operations
Chemical Laboratory Tech.
Chemical Process Operator
Elements of Nuclear Energy
General Chemistry
Instrumental Laboratory
Analysis

CIVIL ENGINEERING

Civil Engineering
Construction Engineering
Highway Engineering
Principles of Surveying
Reading Highway
Blueprints
Sanitary Engineering
Sewage Plant Operator
Structural Engineering
Surveying and Mapping
Water Works Operator

DRAFTING

Architectural Drafting
Design Drafting
Drafting Technology
Electrical Drafting
Electrical Engineering
Drafting
Electronic Drafting
Introductory Mechanical
Drafting
Mechanical Drafting
Pressure-Vessel and Tank
Print Reading
Sheet Metal Layout for
Air Conditioning
Structural Drafting

ELECTRICAL

Electric Motor Repairman
Electrical Appliance
Servicing
Electrical Contractor
Electrical Engineering
(Power option or
Electronic option)
Electrical Engineering Tech.
Electrical Instrument Tech.
Industrial Electrical Tech.
Power Line Design and
Construction
Power Plant Operator
(Hydro or Steam Option)
Practical Electrician
Practical Lineman
Reading Electrical
Blueprints

**CAST
YOUR
BALLOT
FOR
A
SUCCESSFUL
FUTURE!**

253 I.C.S.

Convenient Payment Plan

Special in-plant training programs for industry

New! Special Package for Women



I.C.S. is the oldest, largest school of its kind. Over 200 courses for men and women. High school, business, secretarial, interior decorating, engineering. One for **you**. Direct, job-related. Bedrock facts and theory plus practical

application. You learn from experts. Diploma to graduates.

Clip and mail the coupon **now**. You'll receive, absolutely **FREE**, 3 valuable booklets that have helped thousands. But don't delay. Cast **your** "ballot" today!



**ENGINEERING
(Professional)**

Chemical
Civil
Electrical
Industrial Management for
Engineers
Mechanical

ENGLISH AND WRITING

Better Business Writing
Free Lance Writing
for Fun & Profit
Introductory Technical
Writing
Modern Letter Writing
Practical English
Short Story Writing

HIGH SCHOOL

High School Business
High School (Canadian)
High School College Prep.
(Arts)
High School College Prep.
(Engineering & Science)
High School General
High School Mathematics
High School Secretarial
High School Vocational

LANGUAGES

(Edited by Berlitz)
French
German
Italian
Spanish

LEADERSHIP

Basic Supervision
Industrial Foremanship
Industrial Supervision
Personality Development
Personnel-Labor Relations

MATHEMATICS

Advanced Mathematics
Mathematics and Mechanics
for Engineering
Mathematics & Physics for
Technicians
Mathematics and Physics
for Engineering
Modern Elementary Statistics

MECHANICAL

Aircraft & Power Plant
Mechanic
Industrial Engineering
Industrial Instrumentation
Machine Design
Mechanical Engineering
Quality Control
Safety Engineering Tech'n'gy
Tool Design
Value Analysis

PETROLEUM

Natural Gas Production &
Transmission
Oil Field Technology
Petroleum Production
Petroleum Production
Engineering
Petroleum Refinery Operator
Pipeline Engineering

PLASTICS

Plastics Technician

**PLUMBING, HEATING,
AIR CONDITIONING**

Air Conditioning
Air Conditioning
Maintenance
Domestic Heating with
Oil & Gas
Domestic Refrigeration
Heating
Heating & Air Conditioning
with Drawing
Industrial Air Conditioning
Industrial Heating
Plumbing
Plumbing & Heating
Practical Plumbing
Refrigeration
Refrigeration & Air
Conditioning
Steam Fitting

PULP AND PAPER

Paper Machine Operator
Paper Making
Pulp Making
Pulp & Paper Engineering
Pulp & Paper Making

SALESMANSHIP

Creative Salesmanship
Real Estate Salesmanship
Sales Management
Salesmanship

SECRETARIAL

Clerk-Typist
Commercial
Legal Secretary
Medical Secretary
Professional Secretary
Shorthand
Stenographic
Typewriting

SHOP PRACTICE

Drill Operator
Foundry Practice
Industrial Metallurgy
Lathe Operator
Machine Shop Inspection
Machine Shop Practice
Machine Shop Practice &
Toolmaking
Metallurgical Engineering
Technology
Milling Machine Operator
Multicraft Maintenance
Mechanic
Practical Millwrighting
Reading Shop Prints
Rigging
Tool Engineering Tech'n'gy
Tool Grinder
Toolmaking
Turret Lathe Operator
Welding Engineering
Technology

**STEAM AND DIESEL
POWER**

Boiler Inspector
Industrial Building
Engineer
Power Plant Engineering
Stationary Diesel Engines
Stationary Fireman
Stationary Steam
Engineering

TEXTILES

Carding
Carding and Spinning
Dyeing & Finishing
Loom Fixing
Spinning
Textile Designing
Textile Mill Supervisor
Textile Technology
Warping and Weaving

TRAFFIC

Motor Traffic Management
Railway Rate Clerk
Traffic Management

TV-RADIO-ELECTRONICS

Communications Techn'gy
Electronic Fundamentals
Electronic Fundamentals
(Programmed)
Electronic Fundamentals
with Electronic Equip-
ment Training
Electronic Instrumentation
& Servo Fundamentals
Electronic Principles for
Automation
Electronics and Applied
Calculus
Electronics Technician
First Class Radiotelephone
License
Fundamentals of Electronic
Computers
General Electronics
General Electronics with
Electronic Equip. Trng.
Hi-Fi Stereo and Sound
Systems Servicing
Industrial Electronics
Industrial Electronics
Engineering
Industrial Electronics
Engineering Technician
Practical Radio-TV Eng'g
Practical Telephony
Principles of Radio-
Electronic Telemetry
Principles of Semiconduc-
tor-Transistor Circuits
Radio Servicing with
Equipment Training
Radio & TV Servicing
Radio & TV Servicing with
Equipment Training
Second Class Radiotele-
phone License
Sound Systems Specialist
Telephony, Electronics and
Radio Communications
TV Receiver Servicing
TV Technician

COURSES

Clip coupon—and take your first big step to real success! I.C.S., Scranton, Penna. 18515

In Hawaii: P. O. Box 418, Honolulu
In Canada: I. C. S. Canadian, Ltd.
In other countries: I. C. S. World, Ltd.

FREE! THE I.C.S. SUCCESS KIT!

Three valuable booklets sent to you free when you mark and mail the I.C.S. coupon. No obligation.

1. "How to Succeed"—A new, exciting booklet that lets you evaluate yourself and your future in an entirely different way!
2. Complete catalog outlining job opportunities and outlook in your field of interest.
3. Sample lesson to demonstrate the success-proved I.C.S. method of spare-time study.

Accredited Member, National Home Study Council

INTERNATIONAL CORRESPONDENCE SCHOOLS I.C.S.

Box 3063, Scranton, Penna. 18515

Without cost or obligation, send me "HOW TO SUCCEED," the opportunity booklet about the field I have indicated below, and a sample lesson.

Course in which I'm interested: _____

(Select from listing above)

Name _____ Age _____

(Indicate Mr., Mrs., or Miss)

Address _____

City _____ State _____ Zip code _____

Occupation _____ Working hours _____ A.M. to _____ P.M.

Employed by _____ ☐ I am in the U.S. Armed Forces.

Tell me about special low rates.

While Employed Earn \$9 an Hour In Your Own Business

It's true. Without giving up your regular job—without losing a single pay check—you now have an opportunity to double your income in your own business. A big 24-page book tells how other men do it—then expand to a full time operation. Gross hourly profit \$9.00—PLUS \$6.00 additional on each serviceman. Income unlimited.

Your service is Nationally Advertised, world-wide and endorsed by McCall's and Parents' Magazines. Carpet and upholstery cleaning. Also 5 other superior on location services. You need no experience. We show you how and finance you for all but a few hundred dollars. Easy to learn—easy to do—easy to build up to a good, steady volume because we show you 15 tested ways to get customers.

G. F. Monroe, after 12 months, sold his business for 10 times his cost. Leo Lubel sold his for \$7,116 more than he paid. L. Babbit writes, "I average \$2,600 monthly, part time." W. C. Smith earned \$650 in one week. Ed Kramsky said, "In two years I have two assistants, a home and security."

This may be the opportunity of your life. Find out today before someone else gets your location. Mail coupon now for details and 24-page illustrated free book. No obligation. No salesman will call. Mail coupon now before it's too late.

DURACLEAN COMPANY

6-169 Duraclean Building, Deerfield, Illinois 60015

Please send me your 24-page illustrated book that tells how I can double my income in a business of my own. Everything You send me now is free and I am under no obligation. No salesman will call.

NAME _____

ADDRESS _____

CITY _____

STATE _____ ZIP CODE _____

ELECTRONICS

COYNE ELECTRONICS INSTITUTE

A quarter million dollars worth of equipment. Non-Profit Institute—Est. 1899. Courses: Electronics • Electricity • TV-Radio • F.C.C. • Electronics Engineering Technology. Mail coupon or write for FREE BOOK • No Salesman will call.

★ NEW G. I. BILL STARTS JUNE 1 ★

COYNE ELECTRONICS INSTITUTE Educ. Serv. Dept. 66-S
1501 W. Congress Parkway, Chicago, Ill. 60607

NAME _____ PHONE _____

ADDRESS _____ AGE _____

CITY _____ STATE _____

LEARN TO BE A DENTAL MECHANIC

SECURITY • PRESTIGE • GOOD PAY

Learn at home, in your spare time, to make Crowns, Plates, Bridgework, etc. Dental Mechanics are employed by Dentists, Dental Laboratories or open your own shop, full or spare time. FULL EQUIPMENT OF TOOLS AND MATERIALS INCLUDED WITH COURSE. Low tuition. Easy Terms. Write for FREE BOOK about this money-making profession that's not affected by automation.

McCARRIE SCHOOL OF MECHANICAL DENTISTRY
127 So. 13th Street, Dept. 94, Philadelphia 7, Pa.

300 POWER



Complete Telescope Lens Kit only \$3.98 postpaid

Conquer Space. Explore the Universe. Planets, Moon craters, New Stars etc. Complete Lens Kit consists of 80 inch focal length ground and polished objective lens, eyepiece lenses for 50 POWER, 100 POWER, 150 POWER, 200 POWER, 250 POWER, 300 POWER, and all necessary lens fittings. Easy to make from simple step by step instructions. (Tripod and mount not included.) Money back guarantee.

BUSSE SALES CO., Hartford, Conn., Dept. PM-92

SAVE ON WOOD

Imported & Domestic



CABINET HARDWARE - VENEERS - TOOLS
EVERYTHING for the Wood Shop

New 1967 Catalog Ready!

OVER 1500 ITEMS at MONEY SAVING PRICES! Finest domestic and imported hardwoods . . . all dimensions. Hardwood veneers. Power tools at discount prices. Hardware, lamp parts, upholstery supplies, mosaic tile. Hard to find inlays, bandings, etc. Get new catalog . . . send name, address and enclose 35¢ to pay postage, handling.

CRAFTSMAN WOOD SERVICE CO. Dept. A-96
2729 S. MARY ST., CHICAGO, ILL. 60608

Men! Women! ADVERTISING PAYS BIG

No previous experience, writing or art ability necessary

Hundreds of big pay opportunities for qualified men and women in advertising. Help fill huge need with agencies, stores, manufacturers, or open profitable full or spare time ad agency in your home. No investment, no costly overhead. Learn at home in your spare time. Famous advertising experts guide you step-by-step. Send for FREE ADVERTISING CAREER KIT & 20 Page Book, "Opportunities in Advertising," Job Opportunities Chart, full Home-Business Details—ALL FREE! NO. AMERICAN SCHOOL OF ADVERTISING, University Plaza, Dept. 4179, Newport, Calif. 92660.

LAW FREE BOOK THE LAW TRAINED MAN

Write today for a FREE copy of illustrated law book, "THE LAW TRAINED MAN," which shows how to earn the professional Bachelor of Laws (J.L.H.) degree through home study of the famous Blackstone Law Course. All necessary books and lessons provided. Moderate cost; convenient monthly terms. Write for FREE law training book today.

Blackstone School of Law, 387 N. Michigan Ave.
Dept. 56, Chicago 51, Illinois
Founded 1890

You can make money in



WATCH REPAIR

Learn at home the low cost Sweazey Way

Watch repairing pays up to \$6 an hour, part time watch makers report on survey. Unique and modern Sweazey home study System starts you making repairs right away on Swiss and American watches. Professionally prepared training. No previous experience needed. Special tools provided for practice. Tuition only \$5 a month. Diploma Awarded. Free sample lesson and opportunity book give all facts. Write today. No obligation.

CHICAGO SCHOOL OF WATCHMAKING
Dept. 196, Fox River Grove, Illinois 60021

FREE BOOK and SAMPLE LESSON

CHICAGO SCHOOL OF WATCHMAKING
Dept. 196, Fox River Grove, Illinois 60021
Please rush FREE BOOK and Sample Home Study Lesson.

Name _____ Age _____

Address _____

City _____ Zone _____ State _____

FROM THE PATENT OFFICE **NEW INVENTIONS**

BY M. J. PEDERSEN

Fishermen may relax their own watch for a strike and rely instead on an automatic sentinel that signals the moment a fish is felt nibbling—a light by night, a buzzer by day. Clamped onto either a sand spike—for surf fishing—or boat seat, the signaller earned patent 3,216,142 and 3,228,135 for Julius Kricksfeld and Sol Wasserman, Brooklyn, N.Y. It may be seen at the *Inventors Show*. See page 70.

Highway safety is the concern of a remote-control speed governor that automatically limits the supply of fuel to the engine, earning patent 3,195,671 for Richard Wolfe, Abita Springs, La. It may be connected to a conventional speedometer and controlled either manually or by an external radio transmitter operated by traffic authorities or other authorized persons—such as parents of teenage drivers. The preset maximum speed may be overcome briefly, if necessary for passing or other emergency reasons.

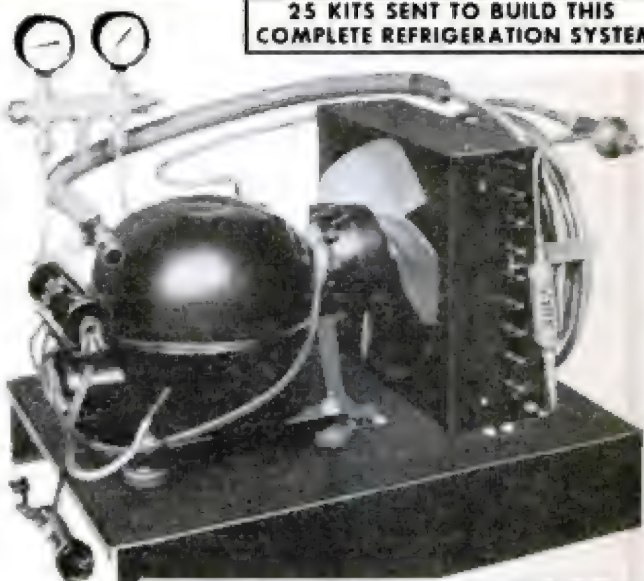
To sleep—perchance to dream—is the pay-off of an electrical sleep inducer that was awarded patent 3,255,753 for Dr. Omar Wing, New York. Electric pulses are slowly applied to a patient's head through pads, producing a tingling around the eyelids. Users report sensing impressions of black and white until the white disappears; sleep presumably occurs when everything becomes black.

A fuel injection system for the Wankel engine to increase the efficiency of fuel usage in the rotary-piston engine, was awarded patent 3,255,738 for Willi Springer and Heinz Lamm, Germany.

Instantaneous transmission of "photographs" from future Mariner probes may be accomplished by means of a semiconductor laser that could cut the 12-hour transmission time of microwaves to a few seconds. Laser light waves may be considered as radio waves of extremely high frequency, capable of carrying thousands of times more information—at least one million "bits" of information per second. In the future, scientists hope to be able to reconstruct photographs from far-flung space missions within minutes. Patents 3,248,669-671 were assigned to IBM., N. Y.

EARN BIG MONEY IN AIR CONDITIONING, REFRIGERATION AND HEATING

25 KITS SENT TO BUILD THIS
COMPLETE REFRIGERATION SYSTEM



NEW
GI BILL

If you served since January 31, 1955 or
are in service, check GI line in coupon

A better job, top pay and steady work are easily within your reach. Learn to repair and install air conditioning systems, refrigerators and freezers. Air conditioning is one of America's fastest-growing industries. Millions of autos and homes are being air-conditioned. The need for trained men is immediate and great.

Make Home Your Training Center — Learn by practicing. CTI sends 25 kits of tools and parts to build a complete refrigeration system — which you later convert into a refrigerator or freezer. The course is easy!

Earn Money As You Train — Since the CTI course includes training with real equipment, many students earn money repairing units soon after enrolling. On completing training they go into top pay jobs. Many get started in their own business.

Mail Coupon Today for free book. No obligation. Prove to yourself that the air conditioning, refrigeration and heating field is best for you — the easiest training to master and loaded with top pay opportunities.

Commercial Trades Institute, Chicago, Ill. 60626

COMMERCIAL TRADES INSTITUTE

1400 Greenleaf Avenue
Chicago, Illinois 60626 Dept. PM-96

Send book, *Be a Success in Air Conditioning, Refrigeration & Heating*. No obligation.

Name _____ Age _____

Address _____ Zip _____

City _____ County _____ State _____

☐ Check for facts on new GI Bill

Accredited Member National Home Study Council



BY JOHN F. PEARSON
SCIENCE
WORLDWIDE

No-shrink wool may be available before too long. So say Australian scientists who have developed a revolutionary process that makes wool fibers so stable they can be given repeated washings without showing appreciable shrinkage.

What color is Love Light? Or Vamp? Or Kitten's Ear? Such fanciful names are becoming commonplace in various industries, from fashions to autos. To help technicians and businessmen—and even the consumer—pin down the hues indicated by the frothy names, the National Bureau of Standards has just compiled a color dictionary and chart containing about 7500 color names and identifications. (In case you're interested, the dictionary says Love Light is greenish yellow, Vamp is light purplish pink and Kitten's Ear is pale yellow.)

The dictionary is called NBS Circular 553 and costs \$2. To get your copy, write to the Superintendent of Documents, U. S. Government Printing Office, Washington, D.C.

Radioactivity in Canadians—polonium-210 in particular—is 80 times higher than it is in residents of London. Diet makes the difference, says the British scientist who made the findings. The Canadians, he explains, live off reindeer and caribou, animals that graze on the lichens that cover vast areas of the Yukon and Northwest territories. It's known that the lichen—a plant that combines a fungus and an alga—absorbs radioactive fallout from the atmosphere.

Weird world of antimatter refuses to stay pinned down. Scientists at New York's Columbia University and State University at Stony Brook, working together, recently came up with a discovery that upsets the previously well-established theory of symmetry—that every particle of matter has its antimatter counterpart, its exact mirror-image.

Some antiparticles, the researchers found, aren't exact opposites in all respects. They found that in the decay of a certain neutral particle, the eta meson, the emerging positive particle is more energetic and travels away from the decay site faster than the emerging negative particle. Now more experiments along this line are planned at several universities.

Cattle like a midnight snack, researchers at the Department of Agriculture have discovered. A specialist in beef nutrition recently finished a six-year study in which he used electric eyes and other gadgets to snoop on cattle. He says the study shows that the bovines take in a quarter of their daily ration at night, regardless of whether their pasture is lighted or not.

Divers now can work hours longer under water, thanks to a new diving system. A ball-like submersible chamber is used to taxi the divers to the work site. They re-enter it when they're ready to come up, and seal it to maintain bottom pressure.

Then they're hauled up to the ship where the submersible is hooked up with twin deck decompression chambers, as

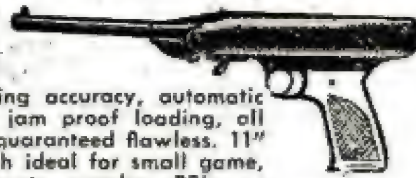


shown in photo, and atmospheric pressure is gradually restored. Thus, the lengthy underwater decompression routine followed by free divers is completely eliminated. The diving system is made by Ocean Systems, Inc., and will soon be used in drilling operations in the North Sea off the coast of Norway.

Outer-space ouch. Astronauts going on future space flights of 30 days or longer will take along a dental kit containing such items as pliers, pain killers, paste to patch up broken or chipped teeth and antibiotics. And before they blast off, they'll have a five-day course in dental techniques. Doctors believe that man's molars may be the major medical problem in space flight.

VIET ARMY OFFICER PISTOL—\$4.98

Double
power fire
from hip



Guaranteed shooting accuracy, automatic cock button. Fast jam proof loading, all steel mechanism—guaranteed flawless. 11" long—lifetime finish ideal for small game, animal pests, shoots regular BB's or "minie" corks. Only \$4.98 plus 60c delivery. White leather holster \$1.00. Ammo: 100 Shots, \$1.00, 200 Shots, \$2.00, 500 Shots, \$4.00, World Co. Dept. 9-PM, 1 Park Ave., New York, N.Y. 10016.

INVENTORS

**INVENTIONS—NEW PRODUCTS—IDEAS
DEVELOPED & PREPARED**

For Commercial Appeal & Sales

DESIGN—MARKETING—PATENT SEARCHES—DRAWINGS

SENT FREE "INVENTION RECORD" Form & "IMPORTANT PATENT INFORMATION"

RAYMOND LEE

130-Z West 42 Street—New York, New York 10036

SECOND DECADE OF RELIABLE SERVICE TO
INVENTORS—MANUFACTURERS—ATTORNEYS

United States Patent Office former Patent Examiner
United States Government former Patent Adviser
Member: United States Chamber of Commerce

be a TAX CONSULTANT

Income unlimited in ever growing profession. Our students are earning lucrative fees in dignified full or part time home-office business preparing income tax returns during busy tax season. Many operate profitable Business Tax Service with steady monthly fees of \$10-\$50. No bookkeeping experience necessary. We train you at home and help you start. Licensed by N.Y. Education Dept. No agent will call. Write for free literature. Accredited Nat'l Home Study Council. Vet Approved.

National Tax Training School, Monsey, R-20, N.Y.

Learn Profitable Profession in few months at Home

MEN AND WOMEN, 18 TO 60

\$4.00 to \$5.00 for 1-hour treatment is the established charge for a skilled operator. Easy to learn and do. Diploma awarded. Open your own office or earn good income from Doctors, Hospitals, Clubs and other health or recreational centers. Wonderful part-time profession. Low monthly payments. Write today for free Anatomy Charts and catalog. No obligation.

ANDERSON SCHOOL OF SCIENTIFIC MASSAGE
Dept. L-1, Princeton, Illinois

**WE'LL SEND YOU
A MONEY-MAKING
"SHOE STORE BUSINESS"**

FREE

Rush postcard today for
free sales outfit

Run your own profitable shoe store at home. Sell to friends, neighbors, folks where you work. Earn \$217.00 EXTRA monthly on just 2 easy orders a day. You feature 230 styles of quality shoes for men and women. Famous Air Cushion Mason Shoes that sell themselves. Sizes 2½-15. Widths AAAA to EEEE. Many comfort features—stock of over 250,000 pair to draw from. Also horse-hide jackets. Represent fast-growing million dollar shoe firm in spare or full time and big profits are yours. Everybody is a customer. You don't need to invest a cent in this wonderful sales opportunity. We'll rush you FREE a complete starting outfit that contains everything you need to begin making money. Just send us a postcard today!

MASON SHOE, Dept. G-414 Chippewa Falls, Wisc.

UNUSUAL BARGAINS

... MANY U. S. GOV'T SURPLUS

'FISH' WITH A WAR SURPLUS MAGNET

Go Treasure Hunting On The Bottom

Great idea! Fascinating fun and sometimes tremendously profitable! Tie a line to our 5-lb. Magnet—drop it overboard in bay, river, lake or ocean. Trawl it along the bottom—your "treasure" haul can be out-board motors, anchors, fishing tackle, all kinds of metal valuables. 5-lb. Magnet is war surplus—Alnico V Type—Gov't. Cost—\$50. Lifts over 125 lbs. on land—much greater weights under water. Order now and try this new sport. Stock No. 70.571-H, 5 lb. Magnet. \$12.50 Postpaid

Stock No. 70.570-H, 3½ lb. Lifts 40 lbs. \$8.75 Postpaid

OPAQUE PROJECTOR

Projects illustrations up to 37" x 31½" and enlarges them to 35" x 30" if screen is 8½ ft. from projector; larger pictures if screen is further away. No film or negatives needed. Projects charts, diagrams, pictures, photos, lettering in full color or black-and-white. Primarily intended for children. Operates on 115 volt. A.C. current. 6-ft. extension cord and plug included. Operates on 60 watt bulb, not included. Size 12" x 8" x 4½" wide. W. 1 lb., 2 oz. Plastic case.

Stock No. 70.199-H \$7.95 Postpaid



See the Stars, Moon, Planets Close Up!

3" ASTRONOMICAL REFLECTING TELESCOPE

60 TO 180 POWER!

Famous Mt. Palomar Type!

An Unusual Buy!

See the Rings of Saturn, the fascinating planet Mars, huge craters on the Moon, phases of Venus. Equatorial Mount with lock on both axes. Aluminized and over-coated 3" diameter high-speed f/10 mirror. Telescope comes equipped with a 40X eyepiece and a mounted Barlow Lens. Optical Finder Telescope included. Hardwood, portable tripod. FREE with Scope: Valuable STAR CHART plus 272-page

"HANDBOOK OF HEAVENS" plus "HOW TO USE YOUR TELESCOPE" BOOK.

Stock No. 85.050-H \$29.95 Postpaid

4½" REFLECTING TELESCOPE—Up to 270 Power

Stock No. 85.105-H \$84.50 F.O.B., Barrington, N.J.

SOLVE PROBLEMS! TELL FORTUNES! PLAY GAMES!

NEW WORKING MODEL DIGITAL COMPUTER

ACTUAL MINIATURE VERSION OF
GIANT ELECTRONIC BRAINS

Fascinating new see-through model computer actually solves problems, teaches computer fundamentals. Adds, subtracts, multiplies, shifts, complements, carries, memorizes, counts, compares, sequences. Attractively colored, rigid plastic parts easily assembled. 12" x 31½" x 4¾". Incl. step-by-step assembly diagrams, 32-page instruction book covering operation, computer language (binary system), programming, problems and 15 experiments.

Stock No. 70.683-H \$5.95 Ppd.

DETAILED PROGRAMMING BOOKLET FOR EXPERIMENTS

Stock No. 9080-H (50 Pages) \$1.00 Ppd.

"Balls of Fun" for Kids ... Traffic Stoppers for Stores
... Terrific for Amateur Meteorologists

SURPLUS GIANT WEATHER BALLOONS

At last ... available again in big 8-ft. diameter. Create a neighborhood sensation. Great backyard fun. Exciting beach attraction. Blow up with vacuum cleaners or auto air hose. Sturdy enough for play; all other uses with reasonable care can be punctured by sharp objects. Filled with helium (available locally) use balloons high in the sky to attract crowds, advertise store sales, announce fair openings, etc. Amateur meteorologists use balloons to measure cloud heights, wind speed, temperature, pressure, humidity at various heights. Photographers can utilize for low-cost aerial photos. Recent Gov't. surplus of heavy, black, neoprene rubber.

Stock No. 60.568-H \$2.00 Ppd.

WAR SURPLUS ELECTRIC GENERATOR

Brand new Signal Corps Electric Generator for scientific experiments, electrical uses, demonstrations. Generates up to 90 volts by turning crank. Use in high impedance relays. Charge ground and bring up night crawlers for bait or study. 2 Alnico Magnets alone worth original price. Wt. 2 lbs. Cost to Gov't. \$15.

Stock No. 50.225-H \$6.95 Pstpd.

Same type generator, mounted, with light, as electricity demonstrator.

Stock No. 50.365-H \$11.95 Postpaid

Order by Stock No.—Send Check or M.O.—Money-Back Guarantee
EDMUND SCIENTIFIC CO., Barrington, New Jersey

MAIL COUPON FOR FREE CATALOG "H"

Completely new 1966 Edition, 148 pages
Nearly 4500 Bargains.

EDMUND SCIENTIFIC CO., Barrington, N. J.
Please rush Free Giant Catalog "H".

Name.....

Address.....

City.....State.....Zip.....



New Nailless Royalcote Panel Application System

takes the hard work out of paneling a room



New Royalcote general-purpose adhesive quickly and permanently affixes Royalcote Panels in place. No unsightly nail holes. Apply with caulking gun over solid backing, furring strips, or studs.



Large, precision-cut Royalcote Panels are made to order for do-it-yourselfers. Easy to handle, easy to line up. They cover a wall in no time flat. Adhesive forms a permanent bond, dries quickly, yet allows adjustment.



Finish the job with Royalcote color-matched moldings. Your choice of metal, or vinyl-covered wood, including base, cove, casing inside and outside corners. Moldings also can be applied with Royalcote Adhesive.

Royalcote Adhesive is ideal for dozens of weekend projects where a strong, dependable bond is needed (dog and bird houses, etc.), making the finished job neat and nailless.



MASONITE

...does it better

Royalcote and Marbletone are registered trademarks of Masonite Corporation.



For a beautiful, professional-looking finished job that's as easy as one, two, three—see your lumber dealer and choose from 13 Royalcote woodgrains, plus Marbletone. Send coupon for full-color booklet.

MASONITE CORPORATION Dept. PM-9
Box 777 • Chicago, Ill. 60690

Please send me the full-color, eight-page booklet,
"How To Be Your Own Decorator Using Royalcote
Woodgrain Paneling."

Name _____

Address _____

City _____ State _____ Zip Code _____

HOMEOWNERS' CLINIC

BY W. CLYDE LAMMEY

Ridding wood of mildew

On reclaiming a chest of drawers I had stored in the basement over the past couple of years, I noticed it had developed a strong musty odor. I've scrubbed it thoroughly with a mild detergent, but the odor persists. I can't understand why this odor developed, since the basement remained dry during the time the chest was stored there. Anyway, can you suggest how the chest can be deodorized?—O.J., Mass.

Perhaps your basement was not as dry as you thought, and since moisture tends to collect in any enclosure, your chest probably became mildewed.

Wait for a sunny day, then take the chest outside, remove the drawers and wash all parts—inside and out—with a 50/50 solution of white vinegar and water. Then let drawers and chest soak up sunshine for four or five hours or longer. Repeat this procedure a second day and chances are your chest will come up smelling like roses. You might then want to lightly sand and revarnish it before putting it back into service.

Winter attic antics

Last winter ice formed on the ends of the shingle nails that project through the roof of my attic. This happened in spite of a number of vents in the wide cornices and near the roof ridge. I tried leaving the door to the attic stairway opened occasionally, hoping the warm air rising from below would dry out the attic. However, this only made the problem worse: the floor became damp. How can this condition be corrected?—F.E., Ark.

When the projecting ends of the nails became colder than the moisture-laden air around them, the air condensed on the nail ends, then turned to ice when the temperature fell to the freezing point. When the temperature rose, this ice melted—hence, the damp floor.

First of all, close that attic door—and keep it closed. You say there are vents, but they may be inadequate; you need about 1 sq. ft. of open vent area for each 100 sq. ft. of attic floor. Adequate circulation of air throughout the attic is imperative if the formation of ice and frost is to be prevented. Also, your attic floor should

be insulated. The use of foil-faced batting is recommended because it also serves as a vapor barrier that prevents moisture rising to the attic from the rooms below.

Crumbling basement plaster

Recently I plastered the poured walls of my new basement with an ordinary mixture of sand and cement. It looked fine for a while, but now it's falling off in huge chunks and massive flakes; this in spite of the fact that I thoroughly dampened the walls before plastering, then carefully troweled it on to a thickness of about $\frac{3}{8}$ in. What's happen?—W.D., N.Y.

Even a top-seeded mortarman can fail to get a new cement mix to bond reliably to an older cement structure. Though you dampened the wall before plastering, the new mix probably lost a substantial portion of its moisture through absorption and evaporation even before its initial "set." Since there was little or no period of cure, the plaster soon disintegrated.

I suggest you scrape off the remaining plaster and let the junkman haul it away. Scrub the walls clean again, then lay on a couple of coats of waterproofing masonry paint. This paint comes in a variety of decorator colors and dries to a soft, flat finish.

Nails pushing out wallpaper

Several nailheads are working out under the wallpaper on a drywall in one of our bedrooms. I'd like to correct this problem before they punch through the wallpaper. Any suggestions?—D.E., Wash.

Use a sharp knife or razor blade to cut a small triangular piece of the paper away from the top of each loose nailhead. Use a nailset to seat the nails below the surface of the wall, then fill the depression over each nailhead with putty. When the putty dries, sand it lightly, then repaste the flap of wallpaper.

Use for double-headed nails

I've just found some nails which are a mystery to me. Nobody I've asked seems to know what they're for. They look like regular nails, except that a little below the head there appears to be a second "head." What are these nails called and what are they used for?—W.H., Miss.

They're called *scaffold nails* because they're mainly used for joining wood scaffolding. The second "head" prevents the nail being driven all the way into the wood, thus allowing its easy removal with a claw hammer when the scaffold is dismantled.

POPULAR MECHANICS
Reports on New
Amco Tool

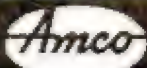
POPULAR SCIENCE
Publishes 6-Page Fea-
ture Article... Follows
with Special Report

WORKBENCH MAG.
Awards "Work Tested"
Seal to Amco Tools

**AMERICA'S TOP MAGAZINES AND 1 MILLION AMCO USERS SAY:
"FANTASTIC VALUES IN PROFESSIONAL QUALITY POWER TOOLS"**

POPULAR SCIENCE shops and crafts editor reports: "... the tools were purchased by Popular Science and put through the same demanding jobs expected of other (far more expensive) shop tools. No gleaming chrome, no fancy extras... sturdy but plain... A good bit of sound—imaginative—engineering." **POPULAR MECHANICS** says, "... (Saw) boasts many features of its bigger brothers." **WORKBENCH Magazine** states: "Jointer-planer does a fine job... 8" blade rips cleanly... low-cost lathe amazingly versatile... we found it to do everything demanded of it." Read the remarkable details and mail the coupon today. You won't go wrong. There's a money-back guarantee* that says so.

**BUY DIRECT FROM
OUR FACTORY...**



POWER TOOLS

**SAVE AS
MUCH AS 80%**

8" TILT ARBOR POWER SAW

\$1495

f.o.b. factory. Wt. 25 lbs.

Includes completely assembled cast iron and steel 8" tilt arbor power saw with ground cast iron table... less blade. If desired, RIP FENCE for easier work alignment, \$3.50 additional



REVOLUTIONARY PATENTS DECREASE COSTS, INCREASE EFFICIENCY
Full scale power tools of heavy duty 100% cast iron and steel. Streamlined design reduces weight, cuts material and production costs. Special patents provide added efficiency, accuracy, savings. Parts made, assembled, tested and packed right in our own factories, shipped direct... save store profits.

DOES WORK OF \$75 BENCH SAW
as is. Converts easily to equal any \$300 floor model cabinet units! Crosscuts, rips, mitres, cuts compound angles, dados, makes coves and mouldings. **FREE CABINET BASE PLANS**

Use as portable bench saw as received (inset photo)... or transform easily and inexpensively into floor model (as shown) guar. to do work of floor models costing \$300. **FREE plans**... sheet of 3/4" plywood and 3-4 hours are all you'll need. Use your AMCO saw for cutting. Plans provide 27" x 24" work surface, 33" height, pullout sawdust bin, tool storage compartment. **10-YEAR FULL SERVICE GUARANTEE***

BLADE TILTS... TABLE STAYS LEVEL

- Locks securely at any angle to 50°
- raises, lowers 0"-2 1/4"
- Patented tilt mechanism, accurate etched scale
- Patented motor mount takes std. 1/4 h.p. or larger motor, keeps belt tight, assures perfect alignment at any angle, transmits full power
- Takes std. blade, saw insert removes to take dado heads, cutters, etc. (not incl.)
- Accurate mitre gauge assembly
- Ground spindle
- Enclosed steel base
- "Compo" bearings
- Accessories available at factory prices
- RIP FENCE, if desired for easier work alignment: Std. size (for bench saw) \$3.50; larger fence (for cabinet base, as ill'd.) \$4.50.

6" SWING 3-FT. LATHE

\$985

f.o.b. factory

Optional Faceplate for turning bowls, trays, lamp bases, rosettes, etc. \$2.50



Complete as shown
DOES THE WORK OF \$40 UNITS
Sturdy all cast iron power tool turns wood or plastics with the precision and speed of machines selling for 4 times as much. Tubular steel bed, ball thrust cup center, spur center, T-Rest assembly, lever action tail stock, 2 speed pulley. Fits any motor.

10-YEAR FULL SERVICE GUARANTEE*

FULL 22" LONG, 4 1/4" JOINTER-PLANER

\$1995

F.O.B. Factory Complete as shown

100% precision ground cast iron and steel.



DOES WORK OF \$60 UNITS

Now, at little more than a hand tool price, a guaranteed professional quality precision machine which does same work as skilled hand planing... much faster, more accurately. Make accurate glue joints; rabbeting cuts for doors, window frames, table drawers; square taper cuts for chair legs; accurate beveling.

- Precision ground cast iron tables, adjustable for depth of cut
- Rigid cast iron base
- New patent-pending design holds clearance between knives and tables at any depth
- Rabbet depth 3/4"
- Hardened, ground high speed steel knives
- Patent-pending fence adjustable to any position, any angle 0°-50°
- Patent pending lift-off guard (nothing to loosen!)
- Balanced steel cutter head.

10-YEAR FULL SERVICE GUARANTEE*

OR 1/2 HP ELECTRIC MOTOR

SPECIAL AMCO PRICE
(when purchased with any unit in this ad)

\$1480

f.o.b. factory
if purchased separately, \$18.95



SPECIAL LIMITED TIME ONLY
Brand new factory-fresh motors for use with any of the units on this page. Limited quantity purchase... first come, first served. Wt.: 17 lbs.
FULL SERVICE 1-YEAR WARRANTY
Otherwise, as described below

MAIL COUPON TODAY!

AMERICAN MACHINE & TOOL CO., Dept. PM-96, Royersford, Pa.

Please send me the units checked. Payment in full enclosed \$... or \$3 deposit each item enclosed. Balance C.O.D. ☐ I MUST BE FULLY SATISFIED OR WILL RETURN UNIT WITHIN 10 DAYS FOR FULL REFUND. No questions asked.

| | |
|---|--|
| <input type="checkbox"/> 8" Power Saw at \$14.95 | <input type="checkbox"/> Jointer-Planer at \$19.95 |
| <input type="checkbox"/> Standard Rip Fence #354 at \$3.50 | <input type="checkbox"/> Lathe at \$9.85 |
| <input type="checkbox"/> Long Rip Fence #354C at \$4.50 | <input type="checkbox"/> Drill Press at \$29.95 |
| 1/2 hp GE Motor: <input type="checkbox"/> \$14.80 (purchased with other item) | |
| <input type="checkbox"/> \$18.95 (if purchased separately) | |

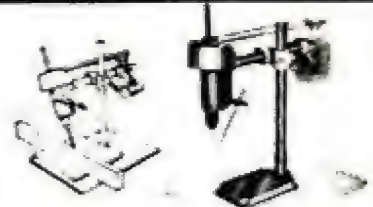
NAME.....
ADDRESS.....
CITY.....ZONE/ZIP.....STATE.....

32" RADIAL DRILL PRESS

\$2995

F.O.B. Factory
1/2" Cap. Jacob's Chuck Inc.
Shipping Wt. 30 lbs.

**DOES WORK
OF \$90
UNITS...
AND A
GREAT
DEAL MORE**



Industrial quality precision machine with all features of standard drill press, many extras. Head raises, lowers. Greatly increased depth of throat. Can be pre-set to any angle or position for on-or-off table drilling... even horizontal drilling. All cast iron and steel.

10-YEAR FULL SERVICE GUARANTEE*

***10-YEAR FULL SERVICE GUARANTEE** Any part or parts of any AMCO power tool which may become inoperative for any reason within ten years after the purchase date will be repaired or replaced by the factory without cost to the purchaser. Your only cost: for postage.



... wherever the good jobs are ... wherever the big money is, employers say

'SEND ME AN NTS MAN!

Today, more than ever, the NTS-Trained Man is in demand. He has all the qualifications for a better job. He earns more money...industry needs and wants him, because NTS training is **ACTIONEERED**. It's specially planned to help you learn quickly, easily. All courses are **shop-tested**, home-study designed, indus-

try-approved. And, you enjoy learning while you prepare for the great opportunities that are always open to the "NTS Man." The four big career fields shown below are the fastest growing in industry today! Note the coupon for complete list of courses. See other side of page for professional tools and equipment.

ELECTRONICS DIVISION:

Get on the big pay wave of today and tomorrow...Electronics! 8 N.T.S. action courses show you how—quickly...Whether it's Color TV Servicing, Radio Servicing, or all around training in the electronics field, N.T.S. is the way to go.

AUTO-MECHANICS DIVISION:

If you live cars, make cars your living...and build yourself a great future! The N.T.S. way gives you the technical training necessary to become a skilled Mechanic fast in any one of four Automotive fields. Check coupon for courses.

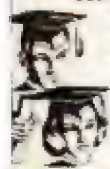
AIR CONDITIONING REFRIGERATION DIV.:

And the profits! N.T.S. gives you the practical skills that pay off big! Air Conditioning and Refrigeration Technicians are needed right now. Move right into this high-profit field through either of the two courses in this division.

HOME APPLIANCES DIVISION:

Get the Home Appliances "know-how" fast...then get in on the big money! All 3 courses are up-to-date, exciting, and a sure-fire way to go out on your own, full time or part-time. Be a Master Technician, or Handy man. Check coupon below

HIGH SCHOOL AT HOME



National offers accredited high school programs. Take only subjects you need. Study at your own pace. Everything included at one low tuition. Check special High School box in coupon for full information and FREE catalog.

CLASSROOM TRAINING AT LOS ANGELES

You can take Classroom Training at Los Angeles in Sunny Southern California. N.T.S. occupies a city block with over a million dollars in training facilities.

NATIONAL TECHNICAL SCHOOLS

WORLD-WIDE TRAINING SINCE 1908

4000 S. Figueroa Street
Los Angeles, Calif. 90037

TEAR OUT AND MAIL THIS CARD TODAY. CHECK ONE ONLY.

ELECTRONICS DIVISION

- ☐ ELECTRONICS-TV-RADIO
Servicing and Communications
- ☐ MASTER COURSE IN ELECTRONICS-TV-RADIO
Color TV and Industrial ELECTRONICS
- ☐ FCC LICENSE COURSE
- ☐ RADIO SERVICING (AM-FM-TRANSISTORS)
- ☐ TELEVISION SERVICING (including Color TV)
- ☐ STEREO, HI-FI and SOUND SYSTEMS
- ☐ BASIC ELECTRONICS
- ☐ ELECTRONICS MATH

HOME APPLIANCES DIVISION

- ☐ HOME APPLIANCES MASTER TECHNICIAN'S COURSE
- ☐ HOME APPLIANCES SERVICING
- ☐ HANDYMAN APPLIANCE REPAIR

AUTO-MECHANICS DIVISION

- ☐ AUTOMOTIVE-DIESEL MASTER COURSE
- ☐ AUTOMOTIVE MECHANICS
- ☐ DIESEL MECHANICS
- ☐ ENGINE TUNE-UP AND ELECTRICITY

AIR CONDITIONING-REFRIGERATION DIVISION

- ☐ AIR CONDITIONING, REFRIGERATION & ELECTRICAL APPLIANCES MASTER COURSE
- ☐ AIR CONDITIONING-REFRIGERATION SERVICING COURSE

HIGH SCHOOL DEPARTMENT

- ☐ HIGH SCHOOL AT HOME Dept. 201-96

NAME _____ AGE _____

ADDRESS _____

CITY _____ STATE _____

Please fill in Zip Code for fast service _____

☐ Check if interested in veteran training under the new GI Bill.

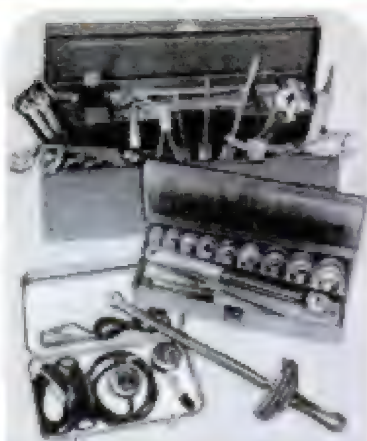
☐ Check if interested ONLY in classroom training at Los Angeles



SEND POSTCARD
FOR FREE BOOK AND
SAMPLE LESSON

BOOST YOUR EARNING POWER PERMANENTLY

Prepare now with these advanced methods in Home Study Training



ELECTRONICS DIVISION

Electronics training opens a world of interesting high-pay jobs, and N.T.S.-trained men can make their own opportunities. Big Equipment Kits come with most Electronics courses at no extra cost; no kit deposits.

AUTO MECHANICS DIVISION

Professional Tools and Equipment come with all NTS Auto Mechanics courses at no extra cost; no kit deposits. Service your own car after the first few lessons; earn while you learn.

AIR CONDITIONING REFRIGERATION DIV.

You get the Tools, Tester, Training Equipment you need at no extra cost; no kit deposits. Learn to handle home and industrial work—start your own business. NTS provides valuable, practical help.

HOME APPLIANCES DIVISION

Courses include Equipment Kits, Tester, Tools. Set up shop soon for full-time or part-time income in this highly profitable field. Courses are designed for easy learning, quick results.

BUSINESS REPLY MAIL

No Postage Stamp Necessary if Mailed in the United States

— POSTAGE WILL BE PAID BY —

NATIONAL TECHNICAL SCHOOLS

WORLD-WIDE TRAINING SINCE 1905

4000 South Figueroa Street
Los Angeles, California 90037

FIRST CLASS

Permit No. 3087
Los Angeles, Calif.

**FILL OUT AND
MAIL CARD TODAY**

**GET FULL COURSE
DETAILS AND
LEARN ABOUT THESE
NTS "EXTRAS"**

1. "No obligation" Enrollment
2. Student Dividend Plan
3. Bonus Classroom Training

**APPROVED FOR
VETERANS**

YOU ENROLL BY MAIL UNDER N.T.S. "NO OBLIGATION" PLAN. WE HAVE NO SALESMEN: IT MEANS LOWER TUITION FOR YOU.



Accredited Member
National Home
Study Council

FREE Key Machine

Kind master locksmiths use. Sells for \$125, but yours FREE with Belsaw Locksmithing Course.



You Can Learn To Be A LOCKSMITH

in your spare time

There's a big demand for skilled locksmiths. You can earn big money either full or part-time in your own home. BELSAW INSTITUTE training, recommended by professional locksmiths, teaches you to make keys, open and repair locks on homes, cars and buildings. Easy, illustrated lessons complete with tools and supplies. Tells you how to build a secure cash profit business. Send for Free Book—No agent will call.

BELSAW INSTITUTE, 1071 Field Bldg., Kansas City, Mo. 64111

REAL ESTATE

BE A BROKER

PAYS BIG! SEND FOR FREE, BIG, ILLUSTRATED CATALOG NOW! Graduates report making substantial incomes. Start and run your own business quickly. Men, Women, all ages, learn easily. Course covers Sales, Property Management, Appraising, Loans, Mortgages, & related subjects. **STUDY AT HOME** or in classrooms in leading cities. **DIPLOMA AWARDED.** Write TODAY for FREE Booklet! Accredited Member National Home Study Council. (Established 1936)

FREE BOOK TELLS NOW

WEAVER SCHOOL OF REAL ESTATE
3521-P Broadway Kansas City, Mo. 64111



DRAINS cellars, cisterns, wash tubs; **\$8.95**
IRRIGATES - CIRCULATES - SPRAYS

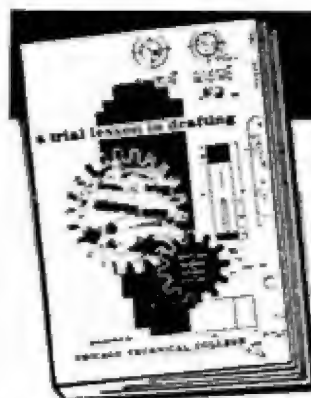
1,001 uses. Stainless shaft. Won't rust or clog! Use 1/8 HP motor or larger... 3/4 HP for up to 2,400 GPH; 450 GPH 80' high; or 1,800 GPH from 25' well. 1" inlet, 3/4" outlet. Coupling included free. **\$8.95.** **HEAVY DUTY BALL-BEARING PUMP.** Up to 5,200 GPH; or 3,000 GPH from 25' well. 1 1/4" inlet; 1" outlet. **\$12.95.** Postpaid if cash with order. **MONEY BACK GUARANTEE**

Centrifugal and Gear Pumps in All Sizes

LABAWCO PUMPS, Belle Mead 7, New Jersey

SAVE 50% on over \$1,500,000 Precious Jewelry

New, 72 page color catalog pictures the most glittering collection of jewelry... rings, watches, charms, precious stones, thousands of selections in actual size—and at 50% OFF LISTED PRICE. Items range from \$10 to \$5,000—for every occasion. Send \$1.00 (refundable with order) for your catalog to: IGC, Box C-108, 18 John St., N. Y., N. Y. 10038



FREE!

Trial lesson in DRAFTING & DESIGN

LEARN AT HOME IN SPARE TIME

Check the want ads in any newspaper—SEE the big-pay opportunities open to you as a draftsman. What's more, you can learn this well-paid, prestige profession at home—quickly, easily! No special talent needed! Get complete, step-by-step Chicago Tech lessons in the mail, spend a few pleasant hours studying each week. In a short time you'll be a well-trained draftsman, ready to take your pick of many good jobs.

FREE INFORMATION—MAIL COUPON TODAY!

Get **FREE TRIAL LESSON** plus information about C.T.C. practical training. Learn what successful Chicago Tech graduates say about high pay and opportunities in drafting. No charge, or obligation.

Est. 1904 Accredited National Home Study Council

CHICAGO TECHNICAL COLLEGE

M-204 Tech Bldg., 2000 So. Michigan Ave.
Chicago 16, Illinois

Mail me **FREE Trial Lesson in Drafting**

Name..... Age....

Address

City..... Zone.... State.....

BUILDING CONSTRUCTION

Free Blueprints and Plan Reading Lesson
Learn blueprint reading, estimating, supervision at home in your spare time. Move up to foreman, superintendent, or contractor. Send **NOW** for free blue prints and lesson.
Dept. PB, 2000 So. Michigan Ave., Chicago, Ill.

CHICAGO TECHNICAL COLLEGE

A single coast redwood tree (*Sequoia sempervirens*) yields enough lumber to build and furnish three large homes.

LEARN MEAT CUTTING AT NATIONAL

Pay After Graduation

The steady dependable trade of Meat Cutting taught easily in 8 short weeks. **YOU LEARN BY DOING** under actual meat market conditions in big modern school at Toledo.

For beginners or men with experience. Get a profitable store of your own. Remember, **PEOPLE MUST EAT!** Big pay jobs. Free employment help. Thousands of successful graduates.

Buying, cutting, percentage, pricing, advertising, selling, etc. A complete retail meat education. National School established 43 years. Get National training now. Pay your tuition in easy monthly payments after you graduate. Send coupon for **FREE 40 page school catalog—TODAY.** G.I. approved.

National School of Meat Cutting, Inc., Dept. 50-L, Toledo 4, Ohio

Send me your **FREE** school catalog on National Training at Toledo in Meat Cutting, Meat Merchandising and Self-Servise Meats. No obligation. No salesman will call.

Name..... Age.....

Address.....

City..... State.....

Approved for Veterans

WHAT'S NEW OUTDOORS

BY STUART JAMES

A consulting engineer for General Electric Co. has taken exception to an item which was included in *Roughing It in High Style* (May PM), an article describing my experiences and misadventures with a 14-foot travel trailer.

"The trailer park yokel," writes Mr. R. H. Kaufmann, "who haywired your electric service connection so that it could be plugged into a two-terminal ungrounded receptacle suspended in a tree was dangerously out of order. The three-conductor power cord and the three-terminal plug with which the trailer was equipped was by no means a stupid mistake. It had been carefully planned to abide by established safety regulations and to best assure you of safety for your trailer and its occupants. The use of the improper connections has in many instances been responsible for the initiation of fires and of electrocution of occupants"

I gleefully showed this letter to my smart-aleck 12-year-old who keeps reminding me of what Burley Farber would do in various situations that leave me completely baffled. He gnashed his teeth over the part where Burley is referred to as a "trailer park yokel," then said: "Do you realize these people would have outlawed Ben Franklin's kite?" And what do you say to that?

Slippery fish can be gripped and held easily with the Fish Mitt, a glove that has an abrasive surface and a metal cleat riveted to the palm. It is particularly use-



ful for removing a hook, but it is also handy when scaling the fish. It sells for \$2.95 from Kebek Industries, Inc., Box 138, Knoxville, Tenn.

Thermos jugs stay sweet over the winter if you drop a piece of charcoal into them before storing them away.

Handguns make me nervous. For some reason the moment a person picks up a revolver his finger slips into the trigger guard and he has to let off a dry run. I was delighted to see a small lock that



fits into the trigger guard to make the gun impossible to fire. It's called the Trigger Lock and it is made by Central Specialties Co., 6030 N. Northwest Hwy., Chicago, Ill. Its price is \$2.49, and it also fits rifles and shotguns.

Nettle juice will surely cure dandruff, and a potion made from marsh-marigold can be used to cure warts, fits and dropsy. This sounds a bit like witchcraft, but it's just Euell Gibbons (*Wild Supermarket in the Woods*, July '65 PM) at it again with another fascinating book about the plant life that abounds in the outdoors. This time Euell is *Stalking the Healthful Herbs* (David McKay Co., \$6.95) and he comes up with a cure for poison ivy, colic and bad complexion. And just for good measure he includes a "recipe" for a worm-wood love charm. For delightful reading this is a book that belongs on your outdoors bookshelf.

Angling records are usually in inches and pounds, but Kervin Hake of Wrightsville, Pa., established one in the numbers. He took 99 fish and a crawdad on one cast! When Hake hauled in a three-pound bass he opened the stomach and found 78 sunfish, 20 minnows and the crawfish.



TOM McCAHILL ADVISES SATURDAY MECHANICS

If you're a Saturday mechanic, my guess is you can fix the screen door, build lawn furniture, overhaul the kid's bike, and rotate your own tires.

It's a different story when that fancy electric coffeemaker stops perking or the push-button automatic washer quits halfway through a cycle. You might spend an afternoon admiring the coffee-maker's innards before giving it a permanent vacation on the top kitchen shelf.

As for the automatic washer, after the Little Lady shouts "Do something!" you'll end up phoning an Appliance Serviceman across town. He shows up in 3 days and has the washer going in one-fourth the time it took you to study the coffeemaker. He also presents you with a ticket for 30 bucks. When you consider he could make twice that selling you a new machine, you got off easy.

Maybe you never realized it, friend, but you have more Appliances around your hacienda today than you did five years ago. If you count power tools, your wife's hair dryer, an air conditioner, plus the standard stuff like vacuum cleaner, toaster, refrigerator, freezer and so forth, you probably have well over a dozen.

These electrical gadgets nowadays represent a pretty good chunk of your hard earned dollars. Did you ever stop to think it could pay you in savings and convenience to know how to fix these things? Also, it could be a great source of extra income if you're inclined to tackle the few thousand broken Appliances right in your own neighborhood.

The Appliance Repair business is easier to learn than you imagine. The National Radio Institute's Appliance Division has a downright interesting, low cost course you can take in your spare time. It covers every type of Appliance you can think of plus air conditioning, refrigeration, house wiring, electric motors—even small gas engines. There's a worthwhile section on farm and commercial appliances too.

NRI starts you with the basic principles of electricity to give you a solid background. Using clear-cut picture diagrams, they show you how various types of Appliances work, separating each into groups. Included with the course is a topnotch, professional Appliance Tester for fast troubleshooting.

Easy to read, bite-size lessons are loaded with photos and cutaway drawings so you see how each Appliance comes apart, and more important—goes back together in working order.

Whether or not you agree that knowing Appliance Repair could help you, I recommend you see for yourself. The little coupon below will get you a free book that fully describes this unique home training. It also brings a free sample lesson. No salesman is going to call.

Do yourself a favor and mail the coupon today.

TOM McCAHILL

APPLIANCE DIVISION, NATIONAL RADIO INSTITUTE
3939 Wisconsin Avenue, Washington, D. C. 20016

600-096

OK—I want to see for myself. Send me the free book on Professional Appliance Servicing and a free sample textbook. No salesman.

Name..... Age.....

Address.....

City..... State..... Zip Code.....

Accredited Member National Home Study Council



**EARN
HIGH
WAGES**
as a **HEAVY
EQUIPMENT
OPERATOR**

Train your way to high pay in the booming construction industry! Learn the skills you need to qualify . . . NOT by correspondence, but by actual field training on machines like the ones used by the industry. Huge training grounds in North Carolina, a million dollars worth of school-owned diesel-engined machines, experienced instructors, full 220-hour and 440-hour courses. National, the original school of heavy equipment operation, is the recognized leader. Member American Road Builders Assn., Services and Supply Division. Associate Member A.G.C. Full-time Job Advisory and Counseling Director on staff. VA approved. For men ages 17 to 56. Train Now-Pay Later plan . . . other payment plans also available. Write TODAY for FREE catalog and FREE copy of school newspaper reporting news of National School graduates.

**NATIONAL SCHOOL
OF HEAVY EQUIPMENT OPERATION, Dept. D-79**
P.O. Drawer 1686, Charlotte, N. C.

Please send me FREE illustrated school catalog and complete information. I understand there's no obligation.

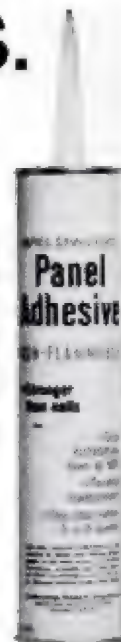
Name _____ Age _____
Address _____ Phone: _____
City _____ State _____ Zip Code _____

**2½ oz. of this
glue is equal
to the strength
of 384 nails.**

Why drive nails into expensive paneling when you can glue it up faster and more securely with Panel Adhesive? It's simple. Just apply adhesive to furring directly from caulking-gun cartridge container. One tube glues up four to five 4' x 8' panels—with a strength equal to 384 nails per panel.

 **U.S. Plywood
Corporation**

2305 Superior Ave., Kalamazoo, Mich. 49003



There's a sweet new Model drifting into your life...

New Model Aromatic



She's a sweet-talking, easy-going mixture—with just a whiff of cherry to sweeten your smoke. Same price as regular Model, too. Come on, don't let this sweet new Model drift by without giving her a try.
NEW MODEL AROMATIC • REGULAR MODEL
United States Tobacco Company

WELLSAW® 400

... The ALL-AROUND Power Saw

Use it

- all-around the home
- all-around the workshop
- all-around the garden
- all-around the clock!

Tough, rugged WELLSAW 400 puts you in the expert class—no matter how tough the saw job you tackle. Handles comfortably as a hand saw, but is power-packed to lick the toughest jobs. Safest power hand saw of them all—even teenagers use it skillfully. Choice of models with 8" or 16" blades. Long-lasting blades are economical, throwaway type, quick and easy to change. Your equipment, hardware or tool dealer has a WELLSAW 400 or can get one for you. See him today.



Trim trees



Trim fence posts



Cut rafters



Cut plywood

Send coupon for "Sawing Magic of WELLSAW 400." 16 pages telling the story of WELLSAW 400 versatility.

WELLS MANUFACTURING CORPORATION
490 Service Road, Three Rivers, Michigan 49093

Name _____

Address _____

City _____ State _____

458

What if I'm laid off?

Will automation take my job?

How can I ever afford to retire?

Am I too old to change jobs?

Can I learn a new skill?

Could I succeed as my own boss?

How can I earn extra money fast?

Will my job ever pay more?

"EARNED \$2000 WHILE TRAINING!"

Says Robert N. Miller, Oakland, N. J.

"I became a locksmith when a back injury forced me to give up my job as truck driver and earned \$2000 while training. Now I own a mobile locksmithing shop and enjoy a successful full time business. My thanks to Locksmithing Institute."



MAIL COUPON NOW

Be a SKILLED LOCKSMITH

... and Solve ALL Your "FUTURE" Problems

... with Locksmithing YOU HAVE IT MADE! You'll do light, clean, fascinating work—take your choice of steady, high-pay jobs or a big-profit spare-time or full-time business with your own "built-in" pension plan. EARN MORE—LIVE BETTER, say "goodbye" to layoffs, automation, slack times, forced retirement!

LOCKSMITHING IS SO EASY TO LEARN—EARN Extra Money FAST. Regardless of age, education, minor physical handicaps, fun and earnings begin AT ONCE. CASH IN on all kinds of locksmithing jobs AT HOME. It's quick and easy! Experts guide you—ALL locks, keys, parts, picks, special tools and equipment, complete illustrated lessons supplied.

FREE illustrated Book, FREE Sample Lesson Pages. MAIL COUPON NOW! Find out how being a skilled Locksmith can help you earn more, enjoy a better life. End your worries—Write TODAY. No salesman will call. Only school of its kind: N.J. State Lic., State Approved Diploma, Accredited Member National Home Study Council.

LOCKSMITHING INSTITUTE
Div. Technical Home Study Schools
Dept. 110-096, Little Falls, N.J. 07424

APPROVED FOR
VETERANS



EST. 1948



306 pieces of equipment
LOCKS, PICKS & TOOLS supplied for use with course.

Locksmithing Institute, Dept. 110-096, Little Falls, New Jersey 07424

Please send FREE Illustrated Book—"Your Big Opportunities in Locksmithing," complete Equipment folder and sample lesson pages—No obligation—(no salesman will call). Check here if Eligible For Vet Benefits. ☐

Name _____ (Please Print)

Address _____

City _____ State _____ Zip _____

CAREER BAROMETER

BY CREIGHTON PEET

JOBS IN SPACE

SOME SUMMER NIGHT a few years from now you may look up at the moon and casually remind your girl friend you had a hand in building that LEM (Lunar Excursion Module) which will, by then, be exploring the lunar landscape. Or maybe you will have worked on some assembly installed in a space laboratory.

Although your chances of being blasted into orbit and walking around in space or on the moon are slim, you may well play a working role in the space program. All over the country, aircraft plants and small subcontracting shops are busy inventing, designing, building and testing space hardware—including some of the most fantastic gadgets ever seen. Even if you only have a high school diploma, there are jobs open to you, although a few additional correspondence-school courses in mechanics, electronics and physics would make you more acceptable.

Some space engineers are highly enthusiastic about two-year tech courses. They say they start a man off just right. After another couple of years on the job, a two-year tech graduate is really ready—and usually financially able—to go on and earn his bachelor's degree. Most big firms doing aerospace work also have scholarship or training programs for men who want to get ahead. In some cases the company pays full cost of such classes for men who get "A", 85 percent for those who get "B" and 75 percent for those with a "C." Meanwhile, as a technician a man earns from \$2.50 to \$3 an hour.

In space work your job may be in any state, working for a local company. On occasion you may be sent to Cape Kennedy, Fla., Huntsville, Ala., or a California launch site to help assemble or adjust

(Please turn to page 26)

| JOB TITLE | RELATIVE NATIONAL DEMAND | 3-MONTH TREND | STATES WITH HIGHEST DEMAND | | | | |
|---------------------------|--------------------------|--------------------|----------------------------|----------|----------|------------|------------|
| Chemists, Biological | 18 | Demand steady | Pa. 2 | Ohio 2 | Minn. 2 | Wis. 4 | Calif. 4 |
| Chemists, Organic | 89 | Good increase | Conn. 5 | Pa. 8 | Ala. 11 | Ill. 7 | Colo. 25 |
| Engineers, Metall. | 54 | Demand steady | N.J. 16 | D.C. 4 | Pa. 4 | Ohio 5 | Ill. 5 |
| Engineers, Civil | 527 | Some decline | D.C. 72 | Pa. 33 | Ohio 68 | Calif. 106 | Wash. 25 |
| Engrs. Elect. & Electron. | 1083 | Demand steady | N.Y. 49 | Ohio 43 | Ill. 40 | Ind. 32 | Calif. 108 |
| Engineers Industrial | 542 | Good increase | N.Y. 81 | D.C. 47 | Fla. 78 | Mo. 65 | Calif. 311 |
| Engineers, Mechanical | 1421 | Slight decline | N.J. 106 | Pa. 64 | Ohio 98 | Wis. 100 | Calif. 310 |
| Engineers, Aero. | 599 | Some decline | Fla. 33 | Ohio 21 | Mo. 65 | Calif. 264 | Wash. 180 |
| Pharmacists | 88 | Demand steady | Va. 10 | Ill. 5 | Ind. 10 | Calif. 8 | Idaho 19 |
| Natural Scientists | 229 | Demand steady | N.J. 19 | D.C. 21 | Tex. 10 | Calif. 6 | Wash. 144 |
| Draftsmen, Architectural | 91 | Some decline | N.Y. 9 | Ohio 8 | Ill. 6 | Calif. 16 | Wash. 9 |
| Draftsmen, Electrical | 288 | Good increase | N.J. 24 | N.C. 20 | Pa. 23 | Mo. 20 | Calif. 150 |
| Draftsmen, Mechanical | 482 | Good Increase | Pa. 74 | Ohio 50 | Wis. 55 | Calif. 48 | Wash. 66 |
| Draftsmen, all other | 420 | Good increase | Pa. 271 | Ohio 27 | Mo. 55 | Calif. 81 | Wash. 42 |
| Tool Designers | 210 | Demand steady | Conn. 21 | Pa. 15 | Mo. 17 | Calif. 50 | Wash. 50 |
| Lab. Tech. & Assistants | 133 | Good increase | Pa. 17 | Fla. 8 | Ill. 10 | Ind. 11 | Minn. 21 |
| Medical Technicians | 202 | Demand steady | D.C. 29 | Md. 21 | Ill. 24 | Colo. 19 | Calif. 19 |
| Sports Instr. & Officials | 21 | Demand cut in half | Conn. 2 | Vt. 2 | N.C. 2 | Pa. 2 | Ind. 2 |
| Surveyors | 13 | Demand unchanged | Va. 3 | Fla. 1 | Iowa 1 | Ark. 1 | Calif. 2 |
| Techs. Eng'g & Phys. Sci. | 812 | Slight drop | Ala. 37 | Fla. 56 | Ohio 60 | Calif. 258 | Wash. 242 |
| Tool Planners | 34 | Slight drop | Ohio 12 | Ind. 7 | Iowa 1 | Kans. 10 | Okla. 4 |
| Systems Engineers | 56 | Good increase | N.Y. 5 | Alaska 2 | Kans. 10 | Mo. 31 | Nebr. 2 |
| Programmers | 485 | Good increase | Ohio 15 | Ill. 10 | Mo. 11 | Calif. 151 | Wash. 227 |
| Systems Analysts | 64 | Demand steady | N.Y. 5 | D.C. 8 | Ohio 4 | Calif. 18 | Wash. 16 |

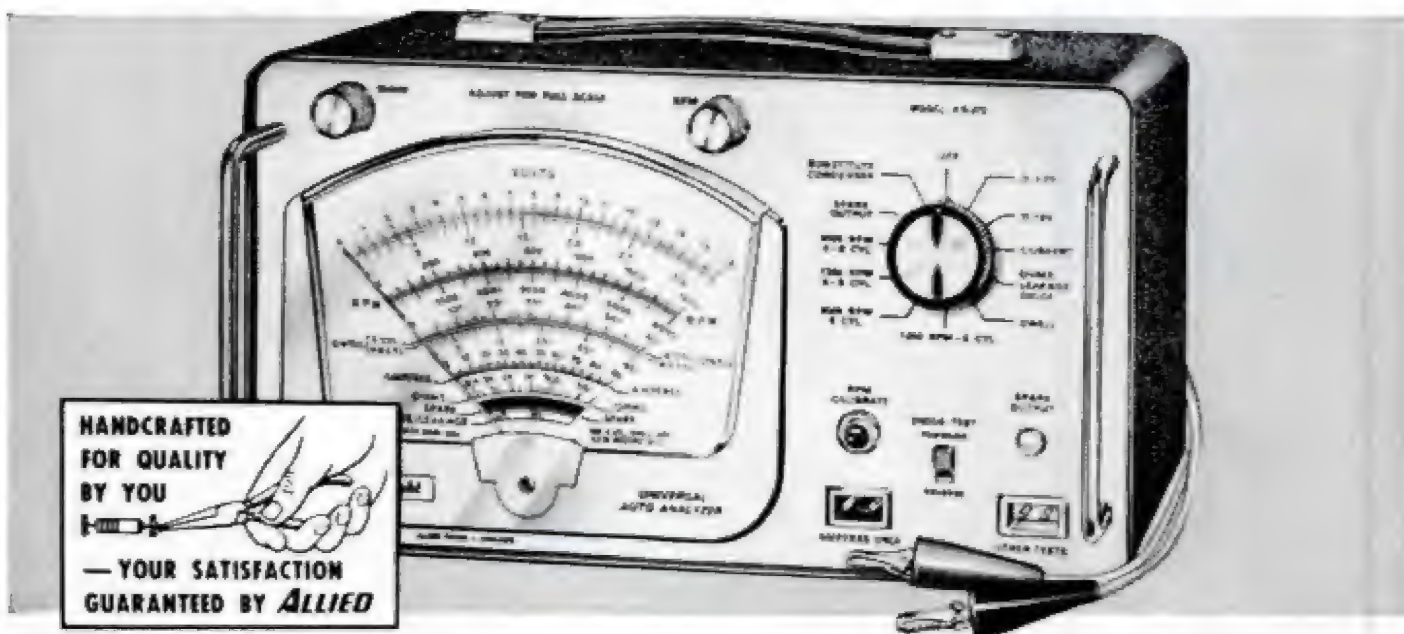
PM's Career Barometer Chart, above, gives the actual number of job openings listed with state employment agencies by various industries. They do not represent all jobs available, but relative demand is reflected. "Relative Demand" figures are true as of our closing date. Check this chart each month and it will tell you where your talents are needed, and how badly. For names of actual employers represented by these

listings, you must apply in person to the state employment agency in the capital city of the state indicated.

Today, with proper schooling, you can qualify for many of the job categories shown. For a list of accredited correspondence and residence schools, write to **POPULAR MECHANICS' Information Bureau, 575 Lexington Ave., N.Y. 10022.**

Don't just take our word for it...

READ WHAT THE EXPERTS SAY ABOUT the *knight-kit*[®] Auto Analyzer



From an article in April 1965
POPULAR SCIENCE:

"A pro mechanic will tell you his analyzer is indispensable. He will probably add that a good one costs over \$100. That's true, if you buy a commercially built one.

If you are willing to wield a screwdriver and soldering iron for an afternoon... you can build your own analyzer for \$49.95. Everything you need—right down to pre-cut and stripped hookup wire and a hank of solder—come in the Knight analyzer kit.

How good is it? The finished analyzer is as accurate as any ready-made unit you'll find on a garage workbench.

Top quality parts are used in the circuit... The main chassis is uncluttered and easy to wire...

The instruction manual is well illustrated and easy to follow."

KNIGHT-KIT GUARANTEE

Build a Knight-Kit in accordance with our easy-to-follow instructions. When you have completely assembled the kit, you must be satisfied or we will return your money, less transportation charges, under the Allied guarantee of satisfaction.

ALLIED RADIO

From an article in June 1965
SCIENCE AND MECHANICS:

"With this new Auto Analyzer you needn't have been born in a grease pit and raised on high-octane gas to accurately diagnose auto ailments. It enables anyone to make his own tune-ups and do his own trouble-shooting with time-saving, money-saving ease."

PERFORMS THESE VITAL FUNCTIONS:

Checks *all* engines—RPM, dwell, condenser, points, plugs, coils—plus automatic transmission shift points, generator, voltage regulator, wiring, batteries, alternators, lights, horn, electric wipers, fuses, etc.

Complete with assembly and operating manuals, leads, batteries and accessories.....

\$49⁹⁵

Read the unique money-back guarantee at left... exclusive in the industry... then rush coupon below for full details and Special Introductory Offer on the Knight-Kit Auto Analyzer.

ALLIED RADIO, Knight-Kit., Dept. 6-JJ
P. O. Box 4398, Chicago, Ill. 60680

Send me full details and Special Introductory Offer on the Knight-Kit Auto Analyzer.

Name _____
PLEASE PRINT

Address _____

City _____ State _____ Zip _____

Test your automotive I.Q.



*What does the
black disc cover?*



What does this symbol stand for?

The black disc covers the automatic choke actuator which has made the choke on the dash a thing of the past. The symbol is very much a thing of the present: it stands for Quaker State Motor Oil—your best engine life preserver. Made from 100% Pure Pennsylvania Grade Crude Oil. Quaker State keeps your car on the road, out of the repair shop and saves you money. Always ask for Quaker State by name—it keeps cars running young.



Quaker State Oil Refining Corporation
Oil City, Pennsylvania

CAREER BAROMETER

(Continued from page 24)

your company's equipment. A third to half of all space equipment is built in California, although plants do this work in New York, Connecticut, Florida, Washington and other states.

Important in the aerospace field is, of course, NASA (National Aeronautics and Space Administration), the federal agency directly involved in developing the peaceful exploration of space. About 70 percent of its jobs are high level, many requiring advanced degrees. This leaves 30 percent of the jobs for technicians and craftsmen.

Most actual construction of space equipment is farmed out to a score of major contractors with plants nationwide. They subcontract work to literally thousands of smaller firms in every conceivable type of production. Among the major space contractors, nearly all aircraft producers, are Bendix, Boeing, Douglas, Dow Chemical, Grumman, Honeywell, Hughes, McDonnell, Lockheed, North American Aviation and TRW Inc. Hiring is usually local, so it is wise to contact plants near your home.

For general information about jobs and educational requirements in the space program, write Educational Programs Div., NASA Headquarters, Code FE, Washington, D.C. 20546.

The firms employ three types: scientists, engineers and technicians. The first two require advanced degrees, but there are plenty of openings for technicians.

Here are some things these support technicians do: tabulate readings from recording instruments, plot graphs, file and index blueprints, compile statistical data, write technical reports, read and interpret blueprints, make models and mock-ups. Other men cut and shape sheet metal, and do riveting, drilling, filing, soldering, cementing and gluing. Still others assemble, take apart and install mechanical and electronic subassemblies, work in laboratories or serve as math specialists. Some work as tool and die makers, or in foundries as patternmakers, molders or coremakers. Many are jig and fixture builders.

Employment in this field is expected to remain steady for the next decade, with several thousands of job opportunities available annually. Though technician jobs are provided chiefly by private manufacturers and NASA, there are openings in universities, the Air Force, Army and Navy for civilian employees.

A word about the draft: at this level, none of these jobs provide an exemption, so employers are inclined to look for men who are a little older or not likely to be called right away. ★ ★ ★

AUDEL SKILL-BUILDING PRACTICAL GUIDES

**LEARN MORE—
EARN MORE!**

ALL-NEW AUTO GUIDE 1966 EDITION



FIX ANY CAR FAST!

NEW FROM COVER TO COVER

The latest, most instructive auto repair guide available today. Explains in detail how to troubleshoot and repair every part and system in any make or model car. Helps you work like a factory-trained mechanic to fix any car fast!

ONLY
\$6.95

biggest Auto
Guide value!

STEP-BY-STEP REPAIR GUIDE COVERS EVERYTHING:
Troubleshooting—unique symptoms-and-causes charts • Engine Tune-up • Spark Plugs • Storage Batteries • Distributors • Ignition Testing • Starters and Generators • Lighting Systems • Tire Servicing • Brakes • Power Brakes • Front Suspension • Steering Systems • Front-Wheel Alignment • Chassis, Springs and Shocks • Fuel Pumps • Carburetors • Cooling Systems • Engine Lubricating Systems • Pistons and Rings • Crankshafts and Connecting Rods • Camshafts • Valves • Manual Transmission and Clutches • Automatic Transmissions • Drive Shafts and Universal Joints • Rear-Axle Assemblies—ABSOLUTELY EVERYTHING YOU SHOULD KNOW TO FIX ANY CAR! 736 pages. Every detail covered in hundreds of illustrations. \$6.95

Circle No. 1 in Coupon

Home Appliance Service Guide

How to fix refrigerators, washers, ranges, toasters, and all other electric & gas appliances. Fully illus. 608 pages. \$6.95

Circle No. 2 in Coupon

Home Refrigeration & Air Conditioning

Servicing, operation and repair of all systems and machines, freezers, lockers, water coolers, etc. Illus. 576 pages. \$6.95

Circle No. 14 in Coupon



CARPENTERS & BUILDERS GUIDES

Four all-inclusive volumes provide latest inside trade information on modern construction. Vol. 1—Tools, Steel Square, Joinery. Vol. 2—Builders Math, Drawings, Specs. Vol. 3—Layouts, Foundations, Framing. Vol. 4—Millwork, Power Tools, Windows, Doors, Roofing, Flooring. Most practical guide available. Thousands of diagrams, charts, graphs and photos. 1616 pages. 4-Vol. Set \$16.95

Circle No. 8 in Coupon



MACHINISTS & TOOLMAKERS GUIDES

Latest shop practices for machinists & toolmakers. Vol. 1 Basic Machine Shop Practices. Practical fundamentals of shop operations. Illus. 416 pgs. \$4.95

Circle No. 12A in Coupon

Vol. 2. Setup & Operation of Machines. Covers all important shop machines. Illus. 512 pages. \$4.95

Circle No. 12B in Coupon

Vol. 3. Toolmakers Handybook. Practical data on layouts, jigs, dies, gears, etc. Illus. 384 pages. \$4.95

Circle No. 12C in Coupon

All 3 Volumes \$13.50—Circle No. 12N in Coupon



new Electric Library

10 volume electrical encyc. Answers questions on thousands of electrical problems. 9000 ill. 5558 pgs. Set \$25.00

Circle No. 15A in Coupon

Practical Electricity

Complete handbook; practical, simplified ready reference on all electrical subjects. 1300 illus. 1088 pages. \$5.95

Circle No. 4 in Coupon

TV-Radio Library

Two vols. on TV & radio circuits & how to install and repair all radio and TV including color. Illus. 960 pages. Set \$9.50

Circle No. 3 in Coupon

**AUDEL PUTS MORE
SKILL IN YOUR HANDS—
MORE MONEY IN
YOUR POCKET!**

Diesel Engine Manual

Complete practical guide to modern Diesel engines. Explains principles & how to maintain & oper. Illus. 544 p. \$6.00

Circle No. 9 in Coupon

Outboard Motor & Boating Guide

Practical details on all phases of outboard motor repair, maintenance and operation. Up-to-date. Illus. 414 pages. \$4.00

Circle No. 49 in Coupon

Mathematics for Mechanics

A complete guide to the mastery of practical math. Simplified method makes learning fast and easy. Ill. 704 pgs. \$4.95

Circle No. 11 in Coupon

Sheet Metal Pattern Layouts

Modern guide to all phases of sheet metal work, including pattern development. 350 layouts. Illus. 1152 p. \$7.50

Circle No. 29 in Coupon

Blueprint Reading

For mechanics and construction men. Step-by-step explanation of how to read all types of blueprints. Ill. 416 pgs. \$4.95

Circle No. 25 in Coupon

Electric Motor Guide

Covers hookups, control, maintenance and troubleshooting of all types of motors. Complete; 617 illus. 1062 pages. \$5.95

Circle No. 27 in Coupon

Millwrights & Mechanics Guide

Practical information on plant installation; operation and maintenance data for foremen & workers. Illus. 1248 pgs. \$6.95

Circle No. 42 in Coupon

Painting & Decorating Manual

Latest inside trade information for painters, apprentices, home owners. Complete; practical. Illus. 592 pages. \$4.95

Circle No. 7 in Coupon

Truck and Tractor Guide

A guide for mechanics, drivers and maintenance men. Gas & Diesel repair, service and operation. Illus. 928 pages. \$5.95

Circle No. 5 in Coupon

Masons and Builders Guides

Four practical vols. for bricklayers, stone masons, cement workers, plasterers. 2000 illus. 1478 pages. Set \$10.50

Circle No. 26 in Coupon

Plumbers & Steam- fitters Guides

4 vols. of ready reference for plumbers, steam fitters, gas fitters, sheet metal workers. 3600 ill. 2272 pages. Set \$10.50

Circle No. 6 in Coupon

Welders Guide

Practical guide to theory, operation. Maintenance of all types of electric, oxy-acetylene & Thermit welding. Ill. 624 p. \$4.95

Circle No. 10 in Coupon

Foreign Auto Repair Manual

Up-to-date service data for all popular imports: English, French, German, Italian, Swedish, Illus. 592 pages. \$5.00

Circle No. 53 in Coupon

Oil Burner Guide

Latest practical book on all home and industrial oil burners. Electrical hookups and wiring data. 320 illus. 420 pgs. \$3.95

Circle No. 28 in Coupon

10-DAY FREE EXAMINATION

SEND NO MONEY—Pay the postman nothing! We are glad to send you any of the Audel Guides for absolutely FREE examination in your own home. We take all the risks and leave all the decisions up to YOU. There is no obligation! If you decide to keep the books of your choice you may pay for them under our astounding easy-pay plan of only \$3 a month.

HERE IS ALL YOU DO—IT'S EASY TO ORDER: In the No-Risk Mail Order Coupon at the right just draw a circle around the number of Audel Guides you want us to send you for FREE EXAMINATION. We will send them to you at once to help you build a brighter future by increasing your SKILL. If you are not COMPLETELY satisfied, return the books, and that will end the matter! NO STRINGS OR CATCHES TO THIS OFFER.



THEODORE AUDEL & CO.
division of HOWARD W. SAMS & CO., INC.
Indianapolis • New York

MAIL THIS NO-RISK COUPON TODAY!

THEODORE AUDEL & CO.—Self Improvement Publishers Since 1879—
4300 W. 62nd Street, Indianapolis, Indiana 46206

—see 1 New Auto Guide

Please mail me for 10 days' FREE EXAMINATION the books I have circled at right. I agree to mail \$3 in 10 days on each book or set ordered, and to further mail \$3 a month on each book or set ordered until I have paid the purchase price, plus shipping costs. If I am not completely satisfied with my Audel Guides I may return them.

Name _____

PLEASE PRINT

Address _____

City _____ State _____ Zip _____

Employed By _____

☐ **SAVE SHIPPING COSTS!** Check here if you enclose complete payment with order (plus sales tax, if any). We pay postage charges. You have same return privilege.

| | | | |
|-----|-----|-----|-----|
| 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 |
| 10 | 11 | 12A | 12B |
| 12C | 12N | 14A | 15A |
| 25 | 26 | 27 | 28 |
| 29 | 42 | 49 | 53 |

☐ I have bought Audel books before

DETROIT

LISTENING POST

ROBERT W. IRWIN

Ford won at Le Mans, months before the race. The GT Mark IIs which came in 1-2-3 at the 24-hour endurance race in France were built to run twice as long. The "design criteria" called for equipment to stand up under 48 hours of Le Mans-type racing, according to Ford Div. general manager Donald N. Frey. And, it did take that much punishment in laboratory tests at the company's engineering center in Dearborn. All the changes in gears and engine rpm in one tour of the 8.3-mile course were fed into a computer. So were the braking applications. The lap average was computed at 3:30, or more than 140 mph. The computer was hooked to test cell 17D in the Ford engine dynamometer building. One signal from the computer program controlled the accelerator, another the clutch, and a third actuated a mechanism to shift the gears. Every 3½ minutes the transmission went through 17 separate gear changes—first gear twice, second gear five times, third gear six times and fourth gear four times. The engine raced up and down from 2600 to 6200 rpm. The process was repeated in the Ford reliability lab, where the car's disc brakes were tested on a four-wheel brake dynamometer, only one in the industry. After describing this, Frey held up a black ring notebook like those sold by the millions to students. "It's all in here," he said. "How to organize and win at Le Mans. It's one of the most expensive notebooks I know of—and it's not for sale."

Computers are making more car design decisions. One played a major part in designing frames for the present Ford Bronco and future Thunderbird and Lincoln models. Another has been used to design automotive gears and hood hinges. The process is still being developed. And William McConnell, director of systems research of the Ford engineering staff, says "it's not too far fetched" to look for the time when computers will design and evaluate parts and automatically program machines to produce them. Called a "structural analysis system," it started when Ford's Philco subsidiary was given a government contract to analyze the makeup of a big radar antenna. Philco studied separate elements of the antenna by computer. Ford's automotive engineers thought they might be able to use it, too. "Car frames looked like one of the easiest ways to try it out and darned if it didn't work," McConnell said.

Eight basic frame configurations of the Bronco were run through the computer; the design that evolved through analytical procedures went into production. In fashioning a car part this way, McConnell explained, an engineer will develop "a tentative design of a frame, specifying what loads he expects it to withstand, and the computer will analyze materials and point out critical stress areas." If the engineer doesn't like the result, he can change the design and get another evaluation.

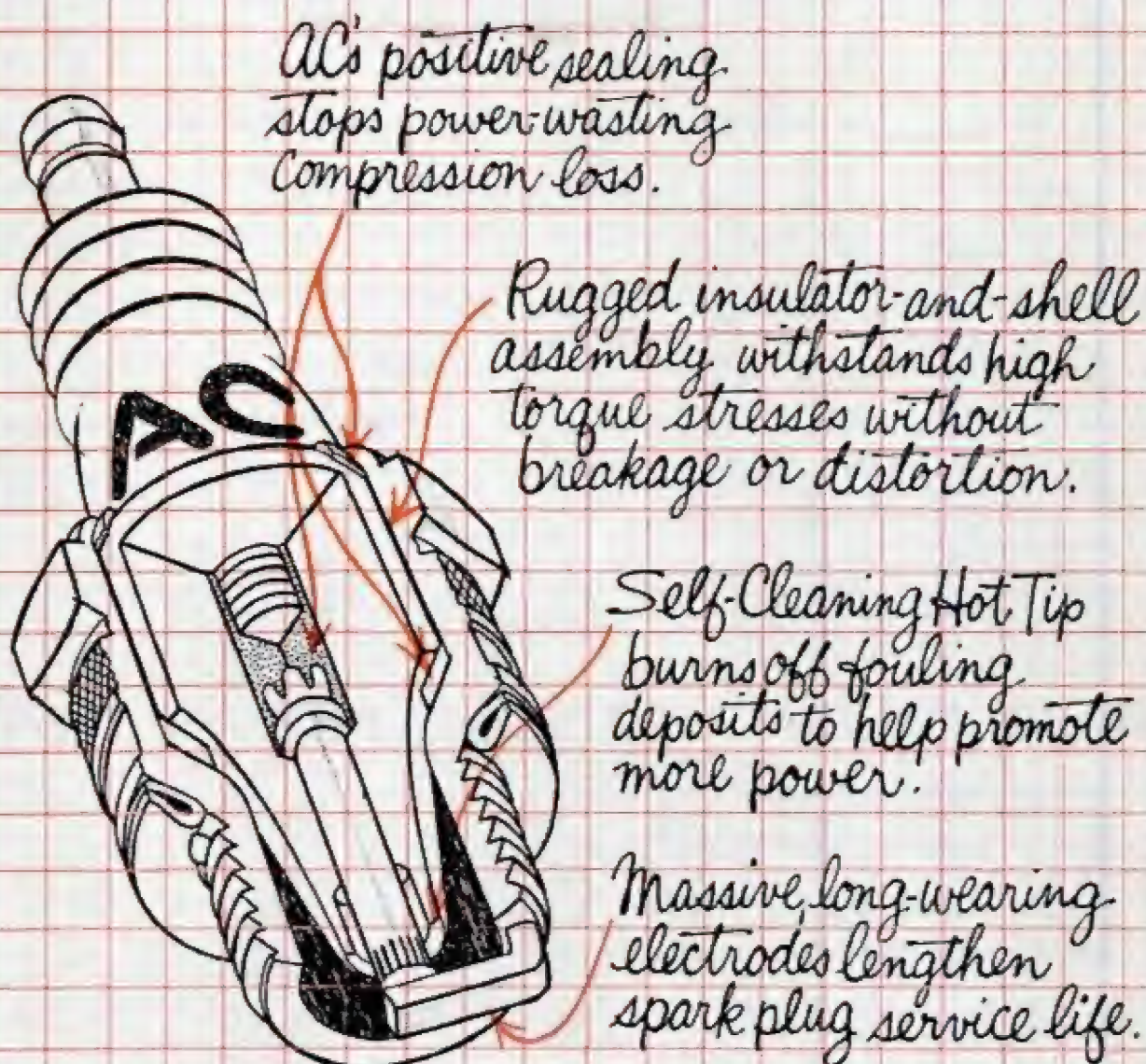
The computer, world's largest except for that used by the Department of Defense, is also being used to coordinate instrument panel work. By continually updating the computer, several design groups can work on the instrument panel area at one time, each aware of what the other is doing. This way, McConnell said, "you don't find out three months later that someone has put the steering column through the radio."

Travel-minded Americans are booming the camper vehicle business. Manufacturers expect to sell 100,000 truck-mounted camper units this year. By 1967 about 400,000 such units should be in use. A recent Chevrolet survey indicates the market could triple by 1970. It found that 60-65 percent of those owning tents will buy truck campers the next time they enter the market. Camper owners now take about ten trips a year, logging about 5000-10,000 miles over 30 days.

Chevy and other automakers supply the basic pickup truck or truck chassis; more than 200 other firms build the camper bodies. A good truck camper combination will

(Please turn to page 30)

From an AC Engineer's notebook:



Why ACs do everything spark plugs are supposed to do... and then some!

A look at AC design features shows you why AC Fire-Ring Spark Plugs give you top performance under all driving conditions. Check AC against any other spark plug and you will find that only AC has all the performance and economy features shown above. Individually, each feature contributes an important benefit. Collectively, these features combine to make ACs do everything spark plugs are supposed to do... and then some. Get the most out of your car — ask for AC Fire-Ring Spark Plugs with your next engine tune-up.

AC SPARK PLUG DIVISION



FIRE-RING
SPARK PLUGS

START A MONEY-MAKING BUSINESS FOR LESS THAN \$50!



You can have your own lifetime business right at home . . . work in spare time . . . and make up to \$200 a month CASH! My FREE PLAN gives you all the facts: How to start, how to grow. You don't need previous experience. You don't have to sell. I'll even finance you. People bring you the work and pay cash. Over 90¢ of every dollar you collect is clear cash profit. And you work when you want to. Let me prove you can't find a more certain, lower cost, higher paying business of your own.

Just Mail Coupon—No Salesman Will Call

BELSAW SHARP-ALL CO., Stan Field, Pres.
7173 Field Bldg., Kansas City, Mo. 64111

Name _____

Address _____

City _____ State _____ Zip _____

**FREE
BOOK**

Big Profits in UPHOLSTERY Get Your Share... FAST!

**EARN
BIG
MONEY** **3** **NEW
EASY
WAYS**

1. Master Craftsmen **EARN MORE.** Be your own boss, make big profits on every job. Booming home and office construction opens big opportunities in custom Upholstery. Slip Covers, Drapes.
2. Start earning **RIGHT AWAY** at home in sparetime—keep upholstered furniture, slip covers you make, or sell for hundreds of dollars.
3. As master of a specialized trade that's always in demand, you say "goodbye" to lay-offs. Take your pick of good jobs—build security as your own boss with a fine craft of your own.

LEARN FAST—EARN FAST
Your own skilled hands are all you need. Expert home training in custom upholstery, slip cover, drapery making does all the rest. You get master upholsterer's tools, new wooden frames, craftsmen's materials, luxurious fabrics, proven business aids, wholesale supply privileges, decorating magic at **NO EXTRA COST!** **FREE BOOK.** Sample Lesson Pages show you how you can double your skills and profits. No obligation—no salesman—Write **TODAY** Upholstery Trades School (Division, Technical Home Study Schools), Dept. 510-096, Little Falls, N.J. 07424. Only Upholstery School: Accredited Member Nat'l Home Study Council, N.J. State Licensed, with State Approved Diploma. Approved for Veterans.

MAIL COUPON TODAY

UPHOLSTERY TRADES SCHOOL

Dept. 510-096

Little Falls, New Jersey 07424

Please send me **FREE** book, "Your New Way to a Successful Career," and **FREE** sample lesson sheets. No obligation—no salesman will call.

Name _____

(Please Print Plainly)

Address _____

City _____ State _____ Zip _____

Check here if eligible for Vet Benefits ☐

FREE
Deluxe Illustrated
Book and **FREE**
Sample Lesson
Pages Give Proof
—Show How



FREE: Master Upholsterer's tools, frames, materials, fabrics and supplies **YOURS WITH COURSE.**

Established
1939

DETROIT LISTENING POST

(Continued from page 28)

cost at least \$4000. If you want to "buy up" to the "motor home" class, it's \$10,000 or more.

Motorized campers aren't new. Back in 1923, Chevy made a truck with a mobile camper mounted on the back. It was a tent designed to sleep two adults in comfort and to fold into the body of the truck when not in use. This principle has been widely adopted for camping trailers, while modern camper bodies have evolved into larger, plusher one-piece units.

Chevy's choice of the Camaro name for its new car was not unexpected, but raised some competitor eyebrows, anyway. "I think they've painted themselves into a corner with the tradition of starting their names with the letter C," one said. He thought Panther, the name popularly given the car during its development period, was better.

AMC vs. VW? American Motors has been dropping hints it may try to compete with Volkswagen in the small-car field. "We have to give the public cars that go beyond what the 'big three' gives them," says new AMC chairman, Robert B. Evans. "We have to offer something different and unique—and this will take time." Two of AMC's new idea cars—Cavalier and Vixen—take dead aim on the subcompact car market. Built on a 108-inch wheelbase, they're 175 inches long, 50 inches high and 65½ inches wide. Tooling costs could be cut more than 30 percent by using interchangeable parts. The left front fender can be swapped with the right rear and the right front with the left rear. In the same fashion, hood and deck lids and doors are interchangeable. Manufacturing costs would also be cut. The little Metropolitan, which AMC once sold in this country, had interchangeable inner panels but the outer skin was different.

That American Motors should enter the small-car field has considerable support within the company.

Evans notes that AMC, home of the compacts, had its greatest success before the "big three" entered the field in force, adding that it "relied too strongly on the compact after the 'big three' entered the market. As far back as 1960, the management should have found another product to put the company in the unique position that the compact had afforded it." But don't look for anything before 1968. In the meantime, Evans hopes the two AMC show cars plus the Cavalier-Vixen combo

(Please turn to page 32)



... Is **FASTER** Fastening Time
with an

ARROW
AUTOMATIC **T-50**

STAPLE GUN TACKER

**SHOOT A STAPLE
Wherever You'd
Drive A Nail!**

**FASTER!
EASIER!
BETTER!**



HEAVY DUTY
Model T-50
\$12.50

USES 6
STAPLE SIZES:
1/4", 5/16", 3/8", 1/2",
9/16" and CEILTILE

Inside . . . outside . . . all around the house—**T-50 STAPLE GUN** speeds up fastening of ceiling tile, insulation, screening, upholstery, weather-stripping, wire fencing, trellises, shelf and closet linings—and numerous other light or heavy duty jobs.

Drives two-pronged, strong-holding staples into hardest wood as fast as you can squeeze the handle! Easy one-hand operation frees other hand to hold material for neater fastening.

Arrow Staple Guns are built of all-steel with a patented jam-proof mechanism for a lifetime of trouble-free performance.

Other Arrow Models
priced from \$4.95.



for 1001 Home Improvement Jobs

AT HARDWARE, LUMBER & BUILDING SUPPLY, STATIONERY, VARIETY AND OTHER RETAIL OUTLETS



"PIONEER and PACESETTERS
FOR ALMOST A HALF CENTURY"

"INVESTIGATING ACCIDENTS

Brings Me Over
\$350.00 A WEEK
IN MY OWN
BUSINESS"

— L. A. Davidson
Universal graduate



Step Into This Booming \$19 Billion A Year Industry

You can earn up to \$15 an hour...repeat, year-round income...in the exciting, fast-growing Accident Investigation field. Car furnished. Business expenses paid. NO selling. NO higher education necessary. NO equipment needed. And age is NO barrier. You can earn while you learn. Keep present job until ready to switch. Rush coupon for all facts and material.

FREE BOOK

UNIVERSAL SCHOOLS Dept. PM-9
6801 Hillcrest, Dallas, Texas 75205
Send **FREE Book** on Big Money In The Amazing Accident Investigation Field. No obligation.

Name _____
Address _____
City _____ State _____ Zip _____ Code _____

MAIL TODAY FOR FREE BOOKLET...

Showing the most beautiful school in the country...elaborately equipped with the most modern, scientific testing equipment known.

Day and evening classes. Good, full & part time jobs and housing provided.

G. I. APPROVED
1645 S. Grand, Dept. P.M., St. Louis, Mo. 63104

Name _____ Age _____
Street _____
Town _____ Zip _____ State _____
Telephone _____

WORLD FAMOUS
BAILEY TECH SCHOOL

DETROIT LISTENING POST

(Continued from page 30)

will help restore public confidence in AMC, where sales have sagged.

Which is the safer construction:

Frame-body construction as in standard Fords and Chevys, or unitized construction as used for Fairlanes, Comets, Plymouths and Ramblers? The question was revived this summer when auto critic Ralph Nader quoted certain claims that frameless cars were not as safe as the other kind. Auto engineers deny there's any major difference. One said, "I don't feel one type is an advantage over the other." In a side impact, he explained, the bumper of one car would probably hit the sheet metal above the frame of the other car.

Traffic-accident research finds the auto industry open-minded. Engineers are seeking ways of building cars to absorb the energy of a crash and spare the driver. In one study, a capsule was filled with hollow steel balls and then smashed into concrete to see how it would crumple. Another study is trying to determine how to make an engine go under the car body in an accident—not through the firewall and into the passenger compartment. After one failure, a test car was radically modified to ensure the engine would slide under the body. Wheels were set out more than a foot from the body and steel plating was welded to the firewall behind the engine. Only the block was left in the engine compartment. With no interference and with no place else for the engine to go, it was felt the test would work. Needless to say, this is a long way from production. And this is just one of many tests undertaken almost weekly by the auto firms.

Another study involved fastening the frame to the body with plastic bolts connected to small explosive charges. In a front-end collision, the charges would blow the bolts, the body would separate from the frame and ride up over the engine. "We have people seriously looking at radical concepts," one auto man acknowledged. Don't expect to see anything as drastic as explosive bolts or capsules filled with hollow steel balls on cars in the near future. The best you can expect, according to an engineer who should know, is a 20-percent reduction in belt load, using standard frame-body construction. This means the force reaching the passenger would be one-fifth less than now on most cars. There are no magic solutions, despite what you might read to the contrary.

Our walnut doesn't turn into maple when you put it on pine.

With over 138 wood stain tones to choose from, and charts showing which to put on what wood, you get the effect you want with Color Tones®. It's a complete system for matching new work to old, moldings to paneling, without guesswork or measuring. Or surprises.



U.S. Plywood Corporation

2305 Superior Ave., Kalamazoo, Mich. 49003



Enjoy the fun of building and the thrill of flying your own Bensen Gyrocopter

Fly low and slow—or high and fast, as you wish—in this easy to handle Copter. World's lowest priced one-man aircraft! Economical to operate. Designed by aeronautical engineers for easy building with hobby-shop tools. Bensen whirlybirds have brought the thrills of personal flying to thousands of amateur and professional flyers all over the world. 3-View Drawings, specs, photos of Gyrocopter \$3 or Gyroglider \$2. Order today!

SEND \$2
or
\$3

BENSEN AIRCRAFT CORP., Dept. PM-96
Raleigh-Durham Airport, Raleigh, N. C. 27602

NAME _____

ADDRESS _____



Don't Growl at Your Service Man—

It's not his fault the By-Pass Valve in a Full-Flow Filter does NOT Filter Oil!

Comes time to change your Oil and Filter... the manufacturer recommends you do this at 6,000 miles. What do you do? If you don't insist on a WIX Multi-Cel Oil Filter, chances are 9 to 2 you'll get one engineered for 2,000 to 3,000 miles! You get 2,000 miles of filtration—the pleated paper gets loaded and the by-pass opens. For the next 4,000 miles you might as well have no Filter at all.

MULTI-CEL IS AN EXCLUSIVE WIX DEVELOPMENT

The superiority of WIX Multi-Cel depth type filtration went largely unnoticed until a major car manufacturer switched from paper. Then, when recommended oil change intervals rose to 4,000, 5,000 and 6,000 miles, the low-mileage paper Filter proved unequal to the job.

Ask for...demand WIX Multi-Cel Oil Filters! Because it doesn't make sense to pay for 6,000 miles of engine protection and only get half of what you pay for.



WIX CORPORATION • GASTONIA, N. C.
CANADA • ENGLAND • NEW ZEALAND

20 WOOD SAMPLES with woodworkers Catalog

ENJOY woodworking more! Let Constantine's big picture-packed Catalog-Manual help you build new furniture — refinish, restore beat-up cabinets, chairs, chests, tables, etc. Find instantly whatever you need. Buy at money-saving prices from world's largest catalog source for imported and domestic woods. Cabinet lumber, carving blocks, veneers, plywood, pipe briar, inlays and more!

Newest Catalog features new tools, materials, shop devices. Fabulous all-purpose clear finish. Glue that needs no clamps. Inlay picture kits, 99¢. Needed products found nowhere else. Plus wood-working instructions, plans, patterns!

Catalog & Wood Samples Only \$1
Dollar Fully Refunded on First Order
Accept this offer to own fascinating set of 20 2x4 specimens of world's glamorous veneers — Rosewood, Satinwood, Lacewood, Teak, etc! Compare! Then instantly identify finest woods wherever you go. Send only \$1 for Wood Samples and Woodworkers Catalog. Dollar refunded on first order.

ALBERT CONSTANTINE AND SON, INC.
2050 Eastchester Rd. Bronx N.Y. 10461 Dept. M-5

☐ Enclosed \$1 for Wood Samples & Woodworkers Catalog. (\$1 refunded) ☐ Catalog only 25¢



Name _____
Address _____
Zip _____

2,000

PRODUCTS FOR SHOP & HOME
Woods — Veneers — Finishes
Furn. Hardware — Lamp Parts
Cane — Upholstery — Tools
Picture Molding — Clock Kits

FREE WITH CATALOG
"101 PROJECT IDEAS"



A Money Making
Opportunity
For You
Handymen

**OWN PROFITABLE
Saw Sharpening
BUSINESS**

If you're handy with tools, here's a practical way to increase your income and build security for your family. Earn extra money every week sharpening saws with a Foley Automatic Saw Filer. You can actually build your own business with it—without special training or previous experience.

FREE BOOK

"Money Making Facts" explains how you can get business from home owners, farmers, carpenters, schools, factories, etc., how to build your business and expand—every step of the easy way. Don't wait. Mail coupon now for this exciting book and easy pay plan. No salesman will call. Mail Coupon Today for Free Book.



Foley Manufacturing Co.
916-6 Foley Bldg., Minneapolis, Minn. 55418

Name _____
Address _____
City _____ State _____ Zip Code _____

**YOUR OWN BUSINESS
MAKE RUBBER STAMPS**

**NEW SIMPLIFIED-PROFESSIONAL QUALITY
BARCO STAMP PRESS**

**PART TIME or FULL TIME
SMALL INVESTMENT
—GOOD INCOME—**

**COMPLETE SUPPLIES
DIRECT FROM MANUFACTURER
FREE BROCHURE-FREE INFORMATION**

BARCO TYPE Mfg.

237-A S. EVERGREEN • BENSENVILLE, ILL. 60106

At Last a New Amazingly Simple

**GAS TURBINE
JET ENGINE**

Build from easy to follow plans. Length 15",
Dia. 8½", Wt. 15 lbs. Fuel: Gasoline or Kero.

"Screamin' Demon" develops 20 H.P. Ideal project for serious-minded hobbyists, students; scientific and industrial arts classes. Make on 9" metal cutting lathe with milling attachment. For use on small racing boats, midget cars, etc. Full size assembly drawings with critical dimensions, bill of materials and photos. Price \$5.00. No C.O.D.

SAVOY SCIENTIFIC, BOX 1398, SANTA MONICA, CALIFORNIA



**EARN
MONEY
FAST!**

REPAIR HYDRAULIC JACKS

Earn while you learn at home. Trained and qualified mechanics needed. NOW to service inoperative hydraulic jacks. BIG opportunity for ambitious men. We show you HOW — in your basement or garage, spare time cash income in an expanding industry. Don't wait, ACT NOW! Get the facts.



Write for folder No. PM9 and free bonus offer.

HYDRAULIC JACK REPAIR MANUAL CO.
P. O. BOX 50 • BLOOMFIELD, N. J.

**LOOK inside your engine
while driving!**

**SEE EACH CYLINDER FIRE
DETECTS**

- Weak Compression
- Faulty Wiring
- Valves
- Bad Plugs
- Grounds
- Shorts



New Electronic Gauge "X-Rays" Engine Ignition—ANALYZES PERFORMANCE—Saves on Repairs—Prevents Power and gas loss due to faulty ignition. This ENGINE ANALYZER actually shows EACH CYLINDER FIRE AS YOU DRIVE!

SHOWS if ignition system is functioning efficiently under ACTUAL ROAD OPERATING CONDITIONS. Tells when a plug is shorting. A series of G.E. INDICATOR TUBES electronically indicate spark condition in each cylinder. A BRIGHT GLOW in each of the NEON tubes show if every plug is operating efficiently. A FLICKERING WEAK LIGHT indicates fouled plug. DEAD LIGHT—dead plug. Easily installed on any car. No special tools required. Can be mounted anywhere. Sent COMPLETE in case with wiring, etc. Will pay for itself. Specify 6 or 8 cylinder.

\$9.95—No C.O.D.'s Please

AUTO-HOME PRODUCTS CO.
431 S. Main St., Rockford, Ill. 61101

If You Can Draw A Straight Line (with a ruler) WE CAN TEACH YOU DRAFTING

Growing consumer and defense industries can't get enough trained draftsmen. Our new teaching methods let you learn in your spare time at home. You learn more, learn faster. Step up the wage ladder with a white collar skill that leads to the top. Send for sample lesson and course outline. Resident course also available on our Chicago Campus. Established in 1934—60,000 graduates.
AMERICAN INSTITUTE OF ENGINEERING & TECHNOLOGY
1125 Fullerton Pkwy—Chicago, Ill. 60614

PROFIT IN YOUR SPARE TIME



SMALL ENGINE REPAIR PAYS BIG!

Outboard • Powermower • Chain Saw • Tractor
MAKE EXTRA MONEY — or fix your own engines and **SAVE!** Illustrated, easy-to-learn Home Study Course qualifies you as expert. Approved for Veterans. Write today!

LINCOLN TECHNICAL INSTITUTE
SUITE 9E, 427 MARKET STREET, NEWARK 5, N.J.



Transistor
Radio with
Battery
\$1.96

17-Jewel
Watch
\$2.67



Derringer
Pistol \$5.74

HOME-IMPORT BUSINESS—Make Big Profits

New Drop Ship Plan offers you first day profits! Deal direct with overseas sources at prices shown. Dazzling bargains with no investment. Full or sparetime. Write for **FREE BOOK** today to...

MELLINGER, 1554 S. Sepulveda, Dept. X259, Los Angeles 25

GET INTO ELECTRONICS

V.T.I. training leads to success as technicians, field engineers, specialists in communications, guided missiles, computers, radar, automation. Basic & advanced courses. Electronic Engineering Technology and Electronic Technology curricula both available. Assoc. degree in 24 mos. H.S. obtainable. G.I. approved. Start Sept., Feb. Terms, campus. High School Graduate or equivalent. Catalog.

VALPARAISO TECHNICAL INSTITUTE
DEPARTMENT D, VALPARAISO, INDIANA



make your own Gems 3650

The Gem Maker comes complete with all necessary equipment, including a super-charged diamond blade for sawing, and all the wheels for grinding, shaping and polishing; also complete instructions. The complete equipment as shown, less motor and belt for only \$36.50, f.o.b., Burlington, Wisconsin. Write today for information and literature.

B&I MANUFACTURING CO.
Dept. P, Burlington, Wis.



EARN UP TO \$50 A WEEK IN
YOUR SPARE TIME AS A

TYPEWRITER REPAIRMAN

Great demand for trained men. Over 25 million typewriters need service and repairs! Cash in on this 300 million dollar market. Now you can get industry-approved training at home. Easy to learn. Low Cost. Qualify quickly in your spare time for a high paying job or a business of your own. Earn while you learn. Real typewriters, sub-assemblies, visual aids, and professional tools provided at no extra cost. Simple, clear illustrated lessons. Expert teachers personally guide you all the way. Fully licensed, accredited, and approved school. State authorized diploma. Mail Coupon Today. Typewriter Repair School, Little Falls, N.J. 07424

TYPEWRITER REPAIR SCHOOL
DEPT. 310-096,
Little Falls, New Jersey 07424

FREE
BOOK ☐

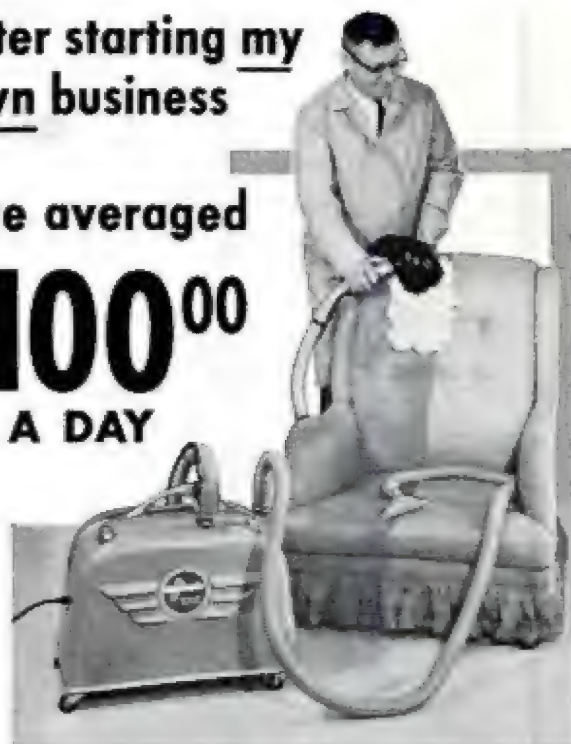
Send **FREE BOOKLET** describing unlimited opportunities for Typewriter Repairmen. No obligation. No salesman. ☐ Check Here For Vet. Information.

Name.....
Address.....
City.....State.....Zip.....

SWORN STATEMENT FROM CHAS. LEMMING:

"After starting my
own business

I've averaged
\$100⁰⁰
A DAY



— most of it Clear Profit! "

Here's your chance to start a money-making year 'round business of your own and make the success you've dreamed about

• In a city of less than 50,000, Mr. Lemming started his own business after filling in coupon like one below. He averaged \$100 a day during first year, some days \$200. F. E. Doran grossed \$1050 in single month. Geo. Held grossed \$300 in one week.

How much you earn depends largely on you. No special skill, no large investment required for our electric upholstery cleaning machine. Start spare time until full time justified. Hire helpers as needed.

NO SHOP NECESSARY • You clean upholstered furniture on customers' premises—homes, hotels, motels, etc. Auto upholstering, too. No hauling; operate from your home. Watch business grow as satisfied customers tell friends. Supplies cost little, profits high. We will help you to start and work with you for your success. Training and consulting with experts is available at no extra cost.

OURS IS NOT A LEASE ARRANGEMENT • You are free to operate in an independent manner. You sign no contract. You own the detergent outright and are always your own boss...and every dollar you take in is yours to keep. You pay no fees, or dues, or royalties to anyone, and enough supplies come with it to return far more than your investment. Many earn the cost of the detergent in a week or two. It costs nothing to get details...write **TODAY**.

SEND COUPON TODAY

VON SCHRADER MFG. CO. 910 "D" PL., Racine, Wisconsin

Send at once (no obligation) your **FREE** booklet containing information about your **ELECTRIC UPHOLSTERY DETERGENT** and how I can start my own permanent, profitable business.

Name.....

Address.....

City.....State.....Zip Code.....

VON SCHRADER MFG. CO.

SOLUTIONS FOR MECHANICAL HEADACHES

AUTOMOBILE CLINIC

BY MORT SCHULTZ

All cracked up

My 1961 Rambler has developed a small crack in its aluminum block. Is there any means of economical repair?—R. J. Huzak, Richmond, Va.

I checked with several machine shops and none would be willing to guarantee anything on this. In fact, few said they would be willing to tackle the job. The consensus seems to be that the possibility of an effective repair depends on where the crack is located. If it's in an open area where it can be drilled, tapped and plated, you may have success with the repair holding. However, if the crack's in a spot where there's a great concentration of heat, such as between cylinders, there will probably be some distortion and the repair won't hold.

Winter-weary VW

My '65 Volkswagen refuses to start when the temperature drops to around zero. Since winter will soon be here, I'm hoping you can give me some tips as to the causes of this balkiness. My mechanic has checked it and found nothing wrong. —Merlin Wilgers, Wichita, Kans.

There are five common reasons why a VW fails to start in cold weather. Here they are:

- **A weak battery.** It should be at least three-quarters charged and have no weak or dead cells.
- **The wrong oil in the crankcase.** For your area it should be SAE 10W. Use of a good additive such as STP will also help.
- **Ignition timing.** This must be set to specification.
- **Automatic choke.** To check if it's functioning properly, look at the choke while you have someone depress the gas pedal just once; it should click to the bottom of the ratchet. If it doesn't, it should be adjusted so that it does.
- **Improper cranking.** Are you starting the car properly? You should depress the gas pedal only once before cranking.

This one's dying to back up

The only thing wrong with my '57 DeSoto V8 with TorqueFlite transmission

is that the reverse gear won't engage without turning off the engine. What's wrong?—S. Sgt. J. M. Delgadillo, Brookley AFT, Ala.

Seems DeSoto had a bit of a problem with the blocker valve in the valve body of their TorqueFlite transmissions that year (it tended to stick). Before you submit your car to an expensive repair job, I suggest you replace this valve with a new one. Though DeSotos are no longer being made, TorqueFlite is; order the valve from any Chrysler parts dealer.

Where's my answer?

I sent a letter to Auto Clinic three weeks ago and thus far have received no answer. Why?—John Pedersen, Tacoma, Wash.

My sincere apologies to John and other readers with similar complaints. The truth is that Auto Clinic's mail load is so heavy that it sometimes causes delays. We're trying our very best to reply promptly to each letter. Beyond this, we can only beg your indulgence and ask that you please bear with us.

Brake adjustment—Florida style

Here are a couple questions concerning my 1965 Ford Fairlane 500:

1. During servicing recently, a mechanic "adjusted" my emergency brake by engaging the emergency brake, stomping the foot brake and revving hell out of the engine. When I got angry at this he told me it was a common practice with mechanics to "stretch the cable." Is it?

2. My automatic choke operates for the full distance I drive to work (about one mile). This causes fast idle. Can something be done to shut off the choke sooner?—Bob Boynton, Fort Pierce, Fla.

Maybe that's the way they adjust emergency brakes in Florida, Bob, but I've never heard of it and neither have any of the mechanics in my area. I'd be happy to hear from any others in the Auto Clinic audience who are familiar with this "method."

(Please turn to page 38)



For the 33rd time, Champions spark the winner at the Indianapolis 500. This year it was the Mecom American Red Ball Special.

Graham Hill wins the 1966 Indianapolis 500 in a Lola-Ford. Champion equipped, of course. Fact is, the majority of race-winners – and the majority of the world's car manufacturers – use Champions because Champions deliver all-out performance. Why settle for less in your car?



To feel new power, instantly, install new Champions now and every 10,000 miles

AUTOMOBILE CLINIC

(Continued from page 36)

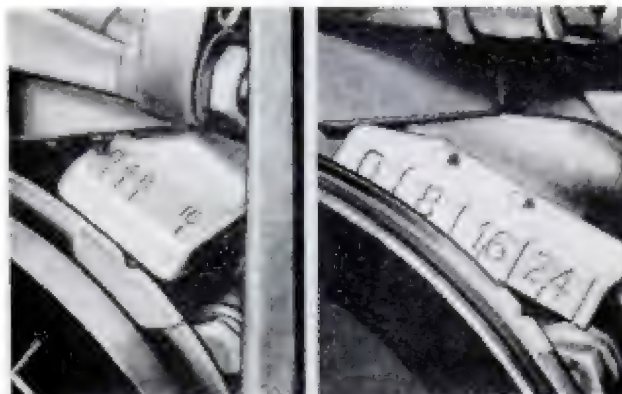
As for that automatic choke problem, you can get the choke to open sooner by rerouting the heater hose nearer the choke housing to concentrate more heat on the choke thermostatic spring. A bracket for this job is available from your Ford dealer.

Timing Corvairs

I have a 1965 Corvair with a 110-hp engine, and equipped with airconditioning. I've always set the ignition timing at 14° BTDC. My buddy, who has an identical car, sets his timing at 24° BTDC and insists that's the correct specification. Who's right?—Lloyd Baxter, Los Angeles.

Probably you're both right. There were two types of engines fitted in these cars. A so-called *2nd Design* engine was installed in the later model '65 Corvairs and superseded a *1st Design* engine that

went in the earlier models of that year. While these engines are identical in every other respect, we can assume that a minor change was made in the distributor.



1st Design (14°)
Ignition Timing

2nd Design (24°)
Ignition Timing

The 1st Design engine takes a 14° timing setting, the 2nd Design engine a 24° setting. You can tell which engine by noting the timing mark plate (see drawing).

Service Tips

- **Pontiac dealers have gotten the word** that some Turbo Hydra-Matic transmissions installed in the 1965 and 1966 models could be heading for trouble. A manual shaft with a single O-ring seal was used in these, and investigation by Pontiac has shown that this shaft can corrode or be damaged by dirt. This has caused some shafts to bind in the bore. Have a manual shaft rubber shield (Part No. 8624975) installed. Pontiac Service News No. 2 (April '66) gave your dealer the poop on this job.

- **Some owners of Ramblers with 199 and 232 CID six-cylinder engines** have complained about a rattling noise during acceleration. The trouble has often been traced to the manifold heat-valve assembly. There's an antifriction spring kit available at your Rambler dealer's for silencing the thing. Consisting of a spring anchor bracket, the kit hooks between the manifold and valve shaft to quiet the rattling heat valve.

- **Are strange noises coming from the front suspension of your Dodge** when making full wheel turns, during a U-turn or a 90° driveway approach? Any model from 1957 through 1964 can produce them.

Since 1957, Dodge has had front-wheel full-turn restriction created by contact between the knuckle arm and the lower control arm (or strut). Motion between these surfaces on extreme wheel turns can cause grunts and groans when the surfaces get rough or corroded. You must eliminate any roughness on the two contact surfaces by filing or buffing them until smooth. Follow with a lubing of water-resistant grease.

Each month Auto Clinic answers your questions on car repair. For a personal reply to your question, enclose 50 cents in coin to cover mailing and handling. Only one question per letter, please. Auto Clinic, Popular Mechanics, 575 Lexington Ave., New York, N.Y. 10022

**SAVE
up to 50%
with
VIKING
build it yourself
PACKAGES**



SEND
DIME FOR
DETAILS

WE FACTORY BUILD
THESE UNITS, TOO!

VIKING CAMPER SUPPLY, INC.

94-8R GLENWOOD, MINNEAPOLIS, MINN. 55403

BUILD THIS \$1,795.00 CAMPER

We'll supply you with all the necessary materials and items from our catalog to complete a 10 ft. or 10'6" Complete Package VIKING CAMPER.

\$847.10

BUILD A \$350.00 PICKUP COVER

Complete Cover Kit includes insulated, paneled interior, EQUIPMENT CATALOG **\$1.00**

Refundable on first order.

ORDER NOW! SEND CHECK OR M.O.

Camper Plans\$3.95
Trailer Plans\$3.95
Pickup Cover Plans\$2.00
Econoline Plans\$2.95
Bus Conversion Plans\$2.95

Name _____
Address _____
City _____ State _____

**NOW! WARN OVERDRIVE
gives 'Jeeps' more Go!**



New approved accessory cuts engine RPM 33% at any speed, reduces noise, vibration so you can drive your Jeep 4-w.d. comfortably at freeway speeds. Amazing synchromesh OD lets you shift up or down, on the go, anytime, in any gear, at any speed. Adds six forward speeds, two reverse. At Jeep dealers, or write us.



WARN SALES CO., Inc.
9050-A Empire Way South
Seattle, Washington 98118

Two or four-cylinder drive
**JEEP or
SCOUT
owners**

REPOWER with a 6 or V-8. H.D. ADAPTORS for using Car, Compact and some Truck engines. Conversion Kits \$45.35 to \$56.90. Want fast action? Give us **FULL INFORMATION**. Send \$15.00 Dep. and we will ship correct kit, bal. COD. Send full amount for prepaid shipment. Wire, phone or write today. Details **FREE**

HOOSIER MACHINE PRODUCTS CO.
312 S. E. 6th St., Phone 276-3442, Pendleton, Oregon

**"\$8,500 PROFIT MY
FIRST YEAR
WITH INLAND 3-IN-1 RADIATOR SHOP"**
—John Burris, Sr., Fredericksburg, Va.

Inland shop owners make good money testing, cleaning, repairing auto-truck-tractor radiators. You can too! Compact shop only 11" x 3'6". Inland, world's largest radiator equip. mfr., trains you free in 2 weeks or less. Pay-As-You-Profit purchase plan. Proved merchandising assures volume. Write for **FREE BOOK**, owner letters, details on program. Profitable dept. for garage or gas station.

INLAND MFG. CO., Dept. PM-9, 1108 Jackson, Omaha, Neb. 68102



Print Your Own

Cards, Stationery, Advertising, Circulars, labels, photo and movie titles, church work, tags, etc. Save money. Sold direct from factory only. Raised printing like engraving, too.

Own a Printing Business

Print for Others. Good Profit. Have home shop. Junior press \$15; Senior \$35 up. We supply everything. Easy rules. Pays for itself in short time. Write now for free details. **KELSEY PRESSES, 2-37 Meriden, Conn.**

EARN \$200 A WEEK

LEARN A TRADE YOU LIKE

After graduation you start as a mechanic in a good paying job; then advance to head mechanic or service manager. Many earn \$200 a week and up. You learn fast in our shops because you learn with tools on real equipment. Some students earn the greater part of their expenses while going to school.

Check the course in which you are interested.

☐ DIESEL MECHANICS ☐ AUTO MECHANICS
☐ WELDING ☐ BODY FENDER REPAIR

Mail to: AUTO-DIESEL COLLEGE

226 7th Avenue, North, Department 86, Nashville, Tennessee
Send me **FREE** catalog about course I have checked, also information about your **FREE** Placement Service.

Name _____
Address _____
City _____ State _____

Excitement! Security! Good Pay!

CRIME DETECTION

LEARN AT HOME IN SPARE TIME—START NOW!

Crime everywhere is on the rise! Learn now, in your own home, the profitable profession that enables you to track down criminals and bring them to justice! Hundreds of Identification Bureaus employ I. A. S. graduates... trained in finger printing, police photography, handwriting identification, firearms and investigation. Our 44th year! **FREE "Blue Book of Crime"**... packed with crime facts and the full story of famous I. A. S. training. State exact age. No salesman will call. Rush Coupon!

A Correspondence School Founded in 1916.

**FREE
Blue Book
of Crime
MAIL
COUPON**

INSTITUTE OF APPLIED SCIENCE, Dept. 1359
1920 Sunnyside Avenue, Chicago, Illinois 60640
Rush Blue Book of Crime... **FREE!**

NAME _____ Age _____
ADDRESS _____
TOWN _____ STATE _____

"NEW SOUND" ACCORDIONS—SAVE 1/2*

**5
Day
Home
Trial**



**WORLD'S
LARGEST
DEALER**

42 NEW ELECTRONIC/STANDARD MODELS

*SAVE 1/2 off retail prices of comparable accordions! 42 exciting new models—Standard, ELECTRONIC, Amplifiers, too! All famous makes. Try before you buy. Free Accessories. E-Z Terms. Trade-ins. Lifetime Performance Policy. Money back guarantee. **FREE** Color Catalogs and Importer-to-You Discount Prices. Rush coupon.

ACCORDION CORP. of AMERICA, Dept. R-96
5535 W. Belmont, Chicago, Illinois 60641

Accordion Corporation of America, Dept. R-96

5535 W. Belmont, Chicago, Ill. 60641
Send **FREE** Catalog of Accordions, Amplifiers—Discount Price List.

FREE
New Color
Catalogs—
Discount
Prices
Name _____
Address _____
City _____ State _____
☐ Check here if you have Trade-in

POPULAR MECHANICS SHOPPING GUIDE



**M'GREGOR
GOES
KING-SIZE!**

FOR TALL OR BIG MEN ONLY

McGregor Jackets, Slacks, Sweaters . . . all extra long. Dress, Sport Shirts with bodies 4" longer, sleeves to 38". Also 70 SMART SHOE STYLES in Sizes 10 AAA to 16 EEE. Hush Puppies, Boots, Dress, Sport, Casual shoes. Mail only, 100% Guaranteed. Send for FREE 48 Page CATALOG. KING SIZE, Inc. 6886 Forest St., Brockton, Mass.



HANDY DANDY STORAGE SYSTEM

Sturdy, plastic caps snap into 1/8" pegboard and hold quarter twist glass jars. Perfect for storing all kinds of small parts and things. Keep your workshop neat. 1 doz. —\$1; 3 doz. —\$2.50; 6 doz. —\$4; 500 —\$25. Handy Dandys only. No jars. Shipping paid anywhere USA. Send payment with order—no C.O.D. Sold only by mail.

WICKLIFFE INDUSTRIES, INC.
DEPT. A-2 WICKLIFFE, OHIO 44092

Please mention
Popular Mechanics
when writing
to advertisers

**SAVE
TIME...
MAKE
MONEY**



Model
Shown
ONLY
\$164.50

MICRO SHARP

**FILE SAWS...
YOURS AND OTHERS**

Professional workmanship comes easy with this portable precision tool which gums, joints, and then sharpens all types of circular saw blades, including cut-off, rip and combination styles as well as carbide tipped, dado heads and blades. Indexer eliminates guess work, sharpens any angle of bevel on circular saws from 4" to 24" diameter. Write for your free copy of "THE SAW FILING MAGIC OF MICRO SHARP".

MARTIN ENGINEERING CO.
806-P Butterworth, S.W., Grand Rapids, Mich.



Radio and Finder: 4-band, 12-transistor portable picks up standard broadcasts, planes in flight, airport control towers, police calls, short wave and complete marine band. Rotating antenna and null meter also make it an accurate radio direction finder for the boat. The 2-lb., 8" x 5" x 2" unit operates 4 ways — internal batteries, external dry cell, house current or sun power from solar cells. Write for FREE booklet. Nova-Tech, Dept. 55, Manhattan Beach, California.

**Stamp Your Name
PERMANENTLY**

reg. size Identify articles
you own
\$3.95
ppd. **EVERSTAMP**

DIE TOOL
Comparable to a \$9.00 die tool, now available at this special price.

- TOOLS
- LUGGAGE
- BOOKS
- SPORTS
- EQT.
- PAINT
- BRUSHES
- PIPES
- GUNS
- FLASH-
LIGHTS
- DRAFTING
TOOLS
- PLUS
HUNDREDS
OF OTHER
ITEMS

Hardened
tool steel. Reg.
Size 1 1/2"
15 letters max.
Last name only.

Names shown actual size
SMITH

Large size 3/4" \$5.25
10 letters max.

Stamp just about anything you own with one blow of a hammer. Made by the Henry A. Evers Co., Inc., makers of quality marking devices since 1898. Makes thousands of impressions. Send check or money order.

HENRY A. EVERS CO., INC.
Dept. P 72 Oxford St., Prov., R. I. 02905

Information not listed on articles in this issue often is given in the
WHERE-TO-FIND-IT list, available at no cost from the
**READERS' SERVICE BUREAU
POPULAR MECHANICS**
575 Lexington Avenue,
New York 22, New York



SEND ONLY \$2.00

Money Back Guarantee HEAVY DUTY-ARC WELDER Life Time Guarantee

All New 110 Volt Heavy Duty Arc Welder. You cannot buy a better welder anywhere at this low price. **NO EXPERIENCE NECESSARY.** Anyone can braze, solder, cut and weld metal up to 1/4" thick. Generates heat to 10,000 degrees for cutting through steel plate, etc. **NOTHING ELSE TO BUY.** Comes complete with heavy duty power cable, twin carbon torch, helmet, instruction book, rod holder, and a supply of 1/16" and 1/8" welding and brazing rods, carbons, and flux, etc. **MONEY BACK GUARANTEE.** Try it for 10 days. If not completely satisfied, we will immediately refund your money without question. **LIFE TIME GUARANTEE.** Never a repair charge for parts or labor. Do not confuse this new improved welder with other units selling for \$14.95. This is a heavy duty deluxe model selling for \$18.95 and we have over 25,000 satisfied customers throughout the world. **SEND ONLY \$2.00** and when delivered pay postman \$18.95 plus postage, or send \$18.95 and we will ship postpaid. (For an extra supply of rods, carbons, and flux, send an additional \$2.00.)

Order Direct from factory: **NATIONAL ELECTRIC, Dept. PM-9, DELRAY, FLORIDA**



Scientific method builds Powerful Muscles in 3 minutes a day

An entirely new, tested method of muscle-building that combines isometric and isometric contraction has been developed by physiologists at the famed Max Planck Institute in West Germany. The unique Tensolator method was successfully used to train the German Olympic team and other champion athletes all over the world. A quick series of 7-second exercises positively strengthens each set of muscles without tedious, strenuous workouts. 3 to 5 minutes a day is all it takes for maximum results (guaranteed or money back). The Tensolator method builds powerful muscles, broadens shoulders, trims waist, increases lung capacity. FREE lavishly illustrated, step-by-step brochure shows you how Tensolator works for men 20, 40, 50 years old or more. Send 25¢ for postage and handling to Dept. PM-3, Thoyle Corp., 509 Fifth Ave., New York, N.Y. 10017.

WANTED: people who like to DRAW



► If you like to draw we will give you 2 FREE Art Lessons. These two Lessons can prove to you how quickly, easily and pleasantly you can learn to draw and paint at home from the world-famous Washington School of Art. In our unique and quiet way, we have been teaching art for 52 years.

You can see for yourself in our free color brochure how well our students paint; read the School catalog without a salesman at your elbow. Tuition is \$6 a month for top-flight lessons and individual corrections on transparent overlays of your art work.

We'll tell you how to get the 2 FREE LESSONS, and will mail information immediately if you mail coupon below.

WASHINGTON SCHOOL OF ART
Studio 149
Port Washington, N. Y. 11050
Accredited Member, National Home Study Council.



Print Name.....

Address.....

City & State..... Zip Code.....



Don't gamble with a dim or dead battery

New emergency power for life's darkest moments

• Activates instantly with ANY water-based liquid — soup, juice, coffee, tea, beer, windshield wiper fluid, etc. • Guaranteed five-year storage without power loss. • Provides full-rated power for two hours continuous use... 72 hours intermittent use. • Designed for U.S. Navy.

Send check or money order to: **GLOBE BATTERY DIVISION, DEPT. 1P-2, GLOBE-UNION INC., P.O. Box 591, Milwaukee, Wis. 53201.**
Please send postpaid.....Light-Paks (battery and lantern) at \$7.95.

NAME.....
ADDRESS.....
CITY.....STATE.....ZIP CODE.....



THOUSANDS OF EXCITING TOOL VALUES!

Stanley, Millers Falls, Skil, Disston, Wiss, Dremel, Speedy

Sprayers, Plumb, Porter, Channellock, Bonney, Herbrand, Helios, Kennedy Boxes, Huot, Vise Grip, Ridgid and many other Nationally Advertised brands of Tools & Supplies too numerous to mention. We Ship Coast To Coast At Prices Hard To Beat. Send 25¢ today for our Big 148-page Tool Catalog.

SILVO HARDWARE CO.
Dept. PMD9, 107 Walnut St.
Phila., Pa. 19106

Investigate Before You INVEST



A radiator service business can be a profitable one! If you are thinking of a business of your own or adding a department write Barbee for details. No investment of \$1500 to \$3000 will pay greater dividends. Two weeks free schooling masters fundamentals. Small down payment starts you. Our easy pay plan lets you pay from profits.



Free Catalog on request.

The BARBEE Co.,
P. O. Box 323PM,
Louisville, Ky.

FREE Electronics Bargain Catalogs for 1 Year!



Exclusive House Brands | Nationally Famous Makes | Closeout Special Buys

Stereo • CB • Parts • Kits, Testers • Tubes • Tools • Tape.

Read the exciting catalogs of America's biggest nationwide electronics store chain. Get our latest issue today.

RADIO SHACK 2727 West 7th St.
Fort Worth, Texas 76107, Dept. PM

Name.....
Street.....
City.....
State.....Zip.....

*** Radio Shack Corp. — Division of Tandy Corp.***

SECRETS of Teaching Yourself MUSIC

revealed in your own home
this money-saving way



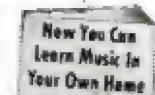
YES! Teach yourself Piano, Guitar, Accordion, Violin, ANY instrument—even if you don't know a single note now! No special "talent," no previous training needed. Famous low-cost U.S. School of Music Course, with step-by-step pictured lessons, make it simple as A-B-C.

Everything is in print and pictures. First you are told what to do. Then a picture shows you how. No boring exercises, no tedious scales. You start by playing actual pieces. Sooner than you may imagine you'll amaze friends by playing your favorite music—popular, classical, jazz, country, dance tunes, etc. Over 1,250,000 students all over the world.

Stop Cheating Yourself of These Joys

Popularity. New friends. Gay parties. Musical career. Extra money. Banish worries, frustrations. Satisfy self-expressions, creative urge. Gain self-confidence.

Write today for 36-page illustrated FREE book. **U.S. SCHOOL OF MUSIC, Studio 309, Port Washington, N.Y. 11050.** (Est. 1898. Licensed by N.Y. State Education Dept.)



FREE BOOK

Print Name.....

Address.....

City.....

State.....Zip Code.....

See your Insulite Dealer for expert advice on quietizing your home.

CONNECTICUT

Bridgeport
City Lbr. Co. of Bridgeport, Inc.
Lemar Kelly 336-3841
F. H. Hannan Supply, Inc.
Art Hannan 333-3139
Cromwell
Shop-Rite Lumber Co.
Dick Buckley 347-4451
Danbury
The Matz Lumber Co.
Irv Goldstein 748-5659
Groton
Diamond National
Paul Whalen 445-9742
Madison
B. B. Munger Lumber Co.
Quenten Chittenden 245-2747
Milford
Builders Supply of Milford
Norman Bedner 874-1633
Puham
Modern Lumber Co.
Raymond Acouin WA-8-5287
Ridgefield
Ridgefield Supply Co.
Tom Thompson 438-2626
Rockville
Rockville Lumber Co.
Alexander Grous 875-0751
South Windham
Windham Lumber Co.
Peter Blais 423-4553
Westport
Torno Lumber
Dick Neville 228-3321

DELAWARE

Middletown
Short & Walls Lumber Co.
George Crossland 378-9568
Milford
Orler Lumber Co.
Robert Kirby 422-4527
Wilmington
Collins Supply Co.
James T. Collins OL-4-5384

MAINE

Kittery
Dion Lumber Co. Inc.
Bob Dion 439-1812
Lewiston
Lewiston Lumber Co.
Val Rioux 784-6484
Waterville
Kennebec Building Supply Co. Inc.
Carl Carey 873-0171

MARYLAND

Baltimore
Bond Lumber Co.
Alvin Wolf DI 2-3421
Essex
Essex Lumber Co.
Carl C. Class MU 7-3030
Maryland
Maryland Lumber Co.
Steve Everd 233-3333
National
National Lumber Co.
Morris Singer OR 5-4740
Cambridge
Webster Building Supply Inc.
Mickey Collins 228-2313
Chestertown
Chestertown Lumber Co.
Benson Duvall 778-2425
Ellicott City
Talbot Lumber Co.
Nathan Holzweig 485-4600
Kensington
Mizell Lumber & Hardware Co.
Bill Mizell 949-0244
Maugansville
Maugansville Elevator & Lumber Co.
Arlin Martin RE 9-4220
Towson
Stebbins-Anderson Co.
Forest Esenwine 823-6600

MASSACHUSETTS

Amesbury
Eastern Lumber Co.
George Little 388-0366
Bellingham Center
Goodhue Cash & Carry
Clarence Cook 473-4070
Buzzards Bay
Eldridge Lumber Co.
Peter Stenquist 759-4461

Cherry Valley
Cherry Valley Bids. Supply
Francis Canavan 892-5211
Danvers
Line Lumber Co.
Bill Kramer 744-2600
East Freetown
Goodhue Cash & Carry
Gene St. Aubin 763-8656
E. W. Goodhue Lumber Co.
Bill Singleton 763-8811
Fitchburg
Webber Cash & Carry
Albert Goguen 342-6748
Webber Lumber Co.
Donald Haaker 343-4831
Gardner
Webber Cash & Carry
Richard Maxfield 632-2127
Gloucester
Gloucester Building Supply Co.
Len Kessel 283-4900
Groveland
Ralph A. Esty & Sons, Inc.
Lloyd Sanders 372-9882
Hudson
R. S. Lamson & Son, Inc.
James Harrington JO 2-3431
Indian Orchard
A. Bolland & Sons Inc.
Joe Augusto 543-4100
Lynn
Atlantic Building & Supply Co.
Aaron "Red" Seligman AT 4-8666
Medford
Line Lumber Co.
Gus Jones 776-6100
Methuen
Forster Lumber Co.
Bob Passler 685-5197
Methuen Lumber Co.
Harry Tatone 682-6371
N. Chelmsford
Webber Cash & Carry
Donald Roberts 251-4038
N. Wilbraham
Howard Lumber Co. Inc.
Ted Samble 596-4470
Norwood
Turnpike Lumber Co.
John Voslik 762-0500
Rockland
Rockland Coal & Grain Inc.
Edward Petrell 878-1130
Saugus
Line Lumber Co.
John Berry 233-1800
Southbridge
Madore Lumber Co.
Fred Guertin 764-2549
Southwick
Battistoni Lumber Co.
Jim Montovani 569-3421
Sterling
Sterling Lumber Co.
Dick Blanchflower 422-7701
Stoughton
Line Lumber Co.
Don Demmons 344-3502
Taunton
Williams Lumber Co. Inc.
Harry Lichfield 824-5897
Three Rivers
J. Belanger Associates
Ted Bonhayer 283-7200
Tynsboro
Sherbourne Brothers
Mr. Sherbourne 649-7413
Westboro
Village Lumber Co.
Paul O'Neil FO 6-7700
Westfield
O'Connor Lumber Co.
Jerry Parenteau 562-2344
Weston
B. L. Ogilvie & Sons, Inc.
Alden Whittemore TW 4-1265

Concord
Suburban Lumber Co. Inc.
Rufus Little 224-4017
Conway
Conway Supply Co.
Bob Davidson 447-5901
Exeter
Wentworth Lumber Co.
Bob Hallinan 772-5933
Hampton Falls
Janvri's Inc.
Ken Knowles 926-3388
Hillsboro
Hillsboro Lumber Co.
Al Weber 464-5595
Jaffrey
Belletete Inc.
Ted Shea 532-7362
Littleton
Prescott Lumber Co. Inc.
Bruce Peck 444-5331
Manchester
Mast Road Grain & Building Matl.
Maurelle Dupuis 622-2833
Valley Brothers
Emil Bernard 689-0041
The West Side Lumber Co.
Bob Handshumacher 622-6401
Meredith
Prescott Lumber Co. Inc.
William Patterson 279-4531
Nashua
Chagnon Lumber Co. Inc.
Joe Auger 883-7776
Nashua Lumber Co.
Bob Robbins 882-2708
North Hampton
Line Lumber Co.
Bob Rowe 964-5646
Northwood
Northwood Supply
Chuck Edgerton 942-5555
Plaistow
Plaistow Lumber & Supply Co. Inc.
Norm Gallant 382-5264
Plymouth
Prescott Lumber Co. Inc.
John Matthews 536-2449
Reeds Ferry
Reeds Ferry Lumber Co.
Guy Foster 424-5514
Silver Lake
John F. Chick & Son, Inc.
Guy Hayford 767-6411

NEW JERSEY

Beach Haven
Firman H. Cranmer Co., Inc.
Fred Lane 492-3111
Cape May
Cape May Lumber Co.
Les Accardi 884-4488
Chifton
Adrian Bakker & Sons Inc.
A. Bakker, Jr. 772-2864
Closter
John J. Demarest
Bob Compton 768-5800
Columbus
Stevenson Lumber Yard
Bob Townsend 298-4550
East Rutherford
Cooper Lumber Co.
Joe Rich 939-1432
Fairlawn
Kuitken Bros. Lumber Co.
Nick Kuiken 796-2082
Hackensack
Fairmount Coal & Lumber Co.
Ray Crampton HU 7-3727
Lambertville
C. A. Niece Co.
Louis Woodman 397-1200
Mt. Holly
French Lumber Co.
George French 267-0010
Newton
Hart & Hill Co's.
L. Griggs 383-1521
Nelsons Point, Lake Hopatcong
Jefferson Lumber
Ralph Quaranta 398-0888
Oak Ridge (Milton)
Van Ness Lumber Co.
Ted Nerlinger 697-5222
Fallsides Park
Grantwood Lumber Co.
Bill Holahan 944-3737

NEW HAMPSHIRE

Bristol
Prescott Lumber Co. Inc.
Ed Greemore 744-3302
Claremont
Hadley Industries Inc.
Norman Patch 542-5178
Colebrook
L. Parkhurst & Sons
Ken Parkhurst 237-4080

Ask for the Insulite Ceilings Specialist by name.

See your Insulite Dealer for expert advice on quietizing your home.

NEW JERSEY

Pateron
Dillistin Lumber Co.
Jack Adsit SH 2-1600
Stiles Lumber Co.
Harry Dente SR 2-8321
Pequannock
Van Ness Lumber Co.
Roger Gromley 694-0020
Saddle Brook
Circle Lumber Co.
Louis Croes 843-5100
South Seaville
J. P. Collins Co.
Joe Gondoly 263-4341
Sparta
Mohawk Lumber Co.
Russ Current 729-3155
Surf City
Tuckerton Lumber Co., Inc.
Bill Edwards 494-2111
Trenton
Olden Paint Factory
Sol Luscher 392-7106
Olden Paint Factory
Michael Serock EX 6-3528
Tuckerton
Tuckerton Lumber Co.
Ernie Moeller 296-2186
Washington
Kings Lumber Co.
King Schaedel 689-3400
Yardville
Yardville Supply Co.
Jack Manion 585-5000

NEW YORK

Albany
Albany Building Center, Inc.
Paul Wagner HQ 3-3211
Bridgeway Lumber Inc.
Al Miller IV 3-7879
Rosano Farm Store Inc.
Joseph Colella 482-4457
Allegany
William N. Hall & Son
Norwood Hall 373-0017
Altamont
Ward G. Ackerman, Inc.
Herb Schaible 861-8543
Amsterdam
Perth Lumber Co., Inc.
William Barnoski VI 2-3620
Arkport
Arkport Lumber Yard
Lyle Young 295-7536
Attica
Attica Lumber Co.
Glenn Sattler 591-2333
Auburn
Osborn Sales Co.
Jack Ferguson 253-8468
Ballston Spa
Curtis Lumber Co., Inc.
Fred Voehringer TU 5-5313
Barneveld
Turner Lumber Co.
Bruce Palmatier 896-2631
Batavia
Liberty Street Lumber Co.
James Holvey FI 3-4200
Bath
L. D. Jones Lumber Yard
Leo Jones Jr. 776-6912
Bayshore
Bayshore Lumber Co.
Steve Raynor MO 5-6111
Beacon
Hunts Square Deal Lumber Co.
Paul Hunt 831-0808
Bethpage
Bethpage Lumber & Supply Co. of L.I.
Inc.
Irving Winkler PE 5-5100
Bridgeport
Bridgeport Lumber Co.
John O'Brien NE 3-9611
Broadalbin
Tanner Lumber & Supply
Ed Tanner 3311
Buffalo
Len-Co. Lumber Co.
"Arnie" TA 2-0243
Weber Lumber Co.
Alfred Weber 832-3636
Canisteo
Home Builders Supply & Hardware Corp.
John Schnurle 698-4201
Castleton
Mid-State Lumber Co., Inc.
Evelyn Dusenbery 732-7747
Cornwall
Ushman Brothers, Inc.
Milton Ushman KE 4-2544
Cuba
Kelly Lumber Co.
Dennis Kelly
Delmar
Delmar Lbr. & Bldg. Supply, Inc.
Quent Turner HE 9-9968
East Rochester
East Rochester Lumber Inc.
Gary Tyler LU 6-0826
Getaville
Cor-Wyn Lumber Co., Inc.
Harold Renaud 632-5797
Gloversville
Burr Lumber Co., Inc.
Bill Dunning 4-7107
Guilderland
Bridgeway Lumber Inc.
Hap Overdorf 482-5081
Hampton Bays, L.I.
F. W. Jackson Lumber
Don Sausser RA 8-0050
Hoosick Falls
Palls Hardware Supply Inc.
Wm. Fitzpatrick 686-7391
Hopewell Junction
Ery Dain Lumber Co., Inc.
Jack Eastman 228-2751
Huntington
Nassau Suffolk Lumber
Dave McNulty HA 3-1700
Hyon
Hyon Lumber Co.
Arnold Smith TW 5-7437
Kirkwood
Wilmarth & Gulino
John Gulino 775-2839
Lackawanna
West Seneca Lumber Co.
Albert Bodge TA 2-6100
Lancaster
J. C. Well Co., Inc.
Floyd Garfield 684-3800
Little Valley
Little Valley Materials Supply, Inc.
Claude Bridenbaker 938-6521
Locust Valley
Nassau Suffolk Lumber
Henry Grimm OR 6-2220
Malden-on-Hudson
Cody Lumber Co., Inc.
Alva Cody 246-2831
Mallory
Mallory Lumber Co.
Millard Breckheimer NO 8-6115
Mattituck
George L. Penny Lumber
Tony Adams MA 9-8559
Mechanicville
Modern Building Supply Co.
Mary Ruggerio 664-3059
Middletown
H. D. Gould Co. 343-4113
Nanuet
Hutton-Johnson Co., Inc.
Lee Frederick NA 3-3851
New Paltz
New Paltz Lumber Co., Inc.
Carl Lilberg 256-4131
Newburgh
Abbey Sales Co., Inc.
Bill Sheley, Jr. JO 1-0157
North Tonawanda
Georgian Bay Lumber Co., Inc.
Ted Jacobs 692-1818
Norton Hill
Oreenville-Norton Hill Lumber Co.
Reile Gardner YO 6-5333
Owego
E. H. Miller Lumber Co.
Mr. Frank Miller MU 7-1351
Peechskill
Creed Brothers Lumber Co.
Scotty Owen PE 7-1828
Perth
Perth Lumber Co., Inc.
Edmund Barnoski VI 2-6300
Poland
Poland Building Supply Corp.
Terrance M. Daly 826-3455
Poughkeepsie
N. I. Pennock Co.
Charles Zammello 452-6030
Rhinebeck
Williams Lumber, Inc.
Sandy Williams 876-3031
Riverhead
Nassau Suffolk Lumber
Jack Folks PA 7-1414

Rochester

New Exchange Lumber Co.
Leonard Raccagline CL 4-8430
Roslyn
Nassau Suffolk Lumber
A. Gilroy MA 1-7676
Salt Point
Williams Lumber & Fuel Corp.
William Day 266-3435
Salvay
De Spirito Lumber Inc.
John DeSpirito HO 8-6285
Sayville
Geo. Rhodes Lumber
Ernest Paul LT 9-0754
Schuylerville
Schneible & Sheppard
Jack Sheppard 695-3289
Southampton
Old Town Building Supply Co.
Geo. Rhodes AT 3-0937
Spencerport
Spencerport Hardware & Lumber Co.
Marty Homuth 352-3488
Spring Valley
Beckerle Lumber—Supply Co., Inc.
Jerry Quinn NA 3-2155
Syracuse
Chapman Lumber Co.
Walter Duffy HA 2-0331
Trumansburg
Millsbaugh Brothers
Donald Carson 387-4641
Utica
Philip Thomas & Sunset Lumber Co.
Gene Tacchelli SW 7-0250
Walton
Rutnells Lumber Co.
Ed Levoy 865-5334
Wantagh
Nassau Suffolk Lumber
George Leonard SU 5-0066
West Coxsackie
Erving Albright Lumber Co.
Howard Decker 731-6811
Wevertown
T. C. Murphy Lumber Co., Inc.
George Van Voorhis NorthCreek 5303
Willisboro
Willisboro Supply Inc.
Ed Welch 963-4061

RHODE ISLAND

Westerly
Atlantic Lumber Co.
Tom Duffey 598-2235
Woonsocket
A. H. Beauchemin & Sons
Gerard Pelletier 782-1657

VERMONT

Bennington
Henry M. Tuttle Co.
Frederick Naef 442-6343
Brattleboro
Smead Lumber Co.
Arthur Edson 254-6058
Enosburg Falls
Wetherbee Farm & Building Supply
933-2107
Essex Jct.
Flanders Lumber Co.
Bill Flanders 878-3381
Jonesville
Plant & Griffith Lumber Co.
Max Bailey 834-2051
Lyndonville
Wheeler Building Materials
Richard Wheeler 626-5102
Manchester Depot
Brown & Hitchcock
Stuart Hill 362-1620
Newport
Prouty & Miller, Inc.
"Chet" Greenwood 334-6533
No. Springfield
E. R. Biben Inc.
Eric Bibens 886-2286
Rutland
Diamond National
Tom Sabotka 775-5549
St. Albans
Plant & Griffith Lumber Co.
Mrs. Lucille Wayne 524-6539
Saxon's River
Tenney's Lumber Mill
Claude F. Tenney 802-3121
West Danville
Larabee's Building Supply
Paul F. Larabee 684-3697
White River Junction
Renehan-Akers Co.
Rodney A. Akers 205-3181

Ask for the Insulite Ceilings Specialist by name.

EXCITING NEW PRODUCTS



Fanspray is the name of a new valve being put on pressurized aerosol paint cans by Tempo Products Co., 6200 Cochran Rd., Cleveland, Ohio. It produces a fine, wide spray that can be applied 4 to 6 in. from the work surface instead of the customary 12 to 18 in., and it makes as uniform a spray pattern as can be had with a professional paint spray gun. Also, it reduces "overspray" by 80 percent.



Now you can sand flat or curved surfaces with one tool—the Flex-Sander—by the Top Line Division of the Oatey Co., Cleveland, Ohio. Tool features a special grip-grit surface that prevents sandpaper from slipping and retards clogging. Ideally suited for home, hobby and marine sanding jobs, tool won't leave flat spots on curved surfaces as do conventional sanding methods. Sells for \$2.79 through hardware dealers.



Home craftsmen will welcome the Sabre-Lathe combination jigsaw and woodturning lathe. Price includes jigsaw blades, a grinding wheel, buffing wheel, wire polishing and cleaning wheel, disc and drum sanders. Its $\frac{1}{3}$ -hp motor has three speeds: 3100, 3300 and 3700 rpm. A product of McGraw-Edison Co., Boonville, Mo. \$34.95.



Jisco lawn and garden auger fits any $\frac{1}{4}$ -in. drill, makes $1\frac{1}{4}$ -in.-dia. holes up to 18 in. deep. A handy aid in fertilizing, watering and aerating trees, shrubs and lawns. Also can be used to drill holes near the house for antitermite chemicals. Available from Johnson's Industrial Supply Co., 1941 Karlin Dr., St. Louis 31, Mo., for \$3.

CLASSIFIED ADVERTISEMENTS

Rate: \$1.40 per word payable in advance each insertion. Minimum insertion ten words. To be inserted under the proper classification, copy must be in our office by the 15th of the second month preceding date of issue. The next available issue to place an advertisement in America's No. 1 Classified Section is November. The closing date is September 15. Send remittance and order to C. A. Martin, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

POPULAR MECHANICS

CHRISTMAS GIFT SHOPPING

CHEAPEST GIFTS! Free full-line catalogue. For men, women. Mandarin International, 214 Shaws Building, Hong Kong.



AUTOMOBILES, MIDGET CARS

AUTOMOBILE Literature. antique, classic, rare reprints. Non-profit hobby club. Free information. Enthusiasts, Box 451B, Mt. Clemens, Mich. 48043.

CAR Collectors! Exact replicas 1/43 scale. Classic, antique, modern. Free catalogue. Miniauto, 7931 Girard Ave., La Jolla, Calif. 92037.

HAVE Trouble on new cars? Why lose time? Facts, money-saving ideas, \$2.00. Automatic Ten, G.P.O. Box 2753, New York, New York 10001.

MODERN Steam cars, classics and antiques described. Complete engineer's plans. Magazine and brochure \$1.00 (Bills no coins). Steam, Kirk Michael, Isle of Man, Britain.

AUTO SUPPLIES AND EQUIPMENT

FOREIGN Car parts. Discounts. Catalog. Box 7, Elmont, N.Y.

CROSLEY. New, used, parts. Discounts. Catalog. Box 7, Elmont, N.Y.

SAVE \$150! Ring-valve job while driving, \$6.00 postpaid. Safe! Guaranteed! Our 15th year! Motaloy, Grantham, Penna. 17027.

NEW And used parts savings. Complete guaranteed service all model cars and trucks. Largest in west. Jeep and Army parts specialists. Shifting hubs for all front-end drive vehicles, \$27.50 up. Foreign parts. Fast service. Pioneer, 734 W. 13th Avenue, Denver, Colorado 80217.

JEOP Owners—VR conversions. Read Jeep Owners ad, page 39.

MILE-O-Meter. A new precision instrument for your car, shows, gas mileage and maximum power. Fits all cars. Complete with all fittings and instructions. Guaranteed. CV-0748 Deluxe Mile-O-Meter, \$14.95. C. E. Hickman And Son, P.O. Box 464, Fernley, Nev. 89408.

GAS Master: fits all cars. Read miles-per-gallon as you drive. Distinctive precision instrument. \$14.95 complete. Jean's, Box 1601, Lufkin, Texas 75901.

FORD Parts new. Free Illustrated Catalog FP10, 1935-1959 cars. Joblot Automotive, 28-11 211th Street, Queens Village, N.Y. 11429.

REMARKABLE New glow gage monitors ignition system. Free details. Q-ar, Box 47876, Los Angeles, Calif. 90047.

AUTOMATIC Speed control. For all 12 volt cars. Only \$8.95 complete. Free details. Arena Enterprises, Box 93, Manistee, Michigan 49660.

FRIENDLY Bumper stickers, orange on white plastic coated. "Hold It Tigerrr" or "Slow down Tigerrr", \$1.00 each. Satisfaction guaranteed. R.D.C., 796 Hancock Ave., Franklin Square, N.Y.

JEOP Parts catalog: Military and Civilian. For owners, dealers, garages, service stations. Save \$\$\$ Surplus and replacements. American Auto Parts Co., 1830 Locust, Kansas City, Missouri 64108.

AUTO TRAILERS

PICKUP Camper, trailer or pickup-cov-er—build yourself, save! Complete plans \$3.95 each. Econoline Camper, foldout trailer, bus conversion drawings, \$2.95 each. Satisfaction guaranteed. Equipment Catalog \$1.00 (refundable on first order). Details 10¢ Viking Camper Supply, 94-P Glenwood, Minneapolis, Minn. 55403.

BUILD Your pickup camper. Precut kits. Blueprints. Supplies. Literature, 10¢. Comstock Trailers, Dept. 664, Parsons, Kansas 67357.

BUILD Aluminum pickup camper over-cab, hi-boy, lo-boy, blueprints, material, list, 3 models included, \$3.00. Bennett Custom Camper, 1500 S. Dallas, Auburn, Indiana 46706.

CAMPER Units for compact buses—Volkswagens, Econoliners, Dodges—Inexpensive—Build yourself—Details. Dot Campers, P.O. Box 57M, Saugus, California.

PRE-Cut pickup camper kits. Ready to assemble. Literature, 15¢. Snowy Mountain Campers, Lewistown, Montana.

CAMPING Trailers, plans & kits. Sleeps 6 or more. Basic kit \$140, tent \$146. Complete plans \$3.00. Circulars, 10¢. Stratford Trailer, Seymour St., Stratford, Conn.

WILD Life decals, full color, large. Free folder. Washington Poster Co., 16824-PMC Pacific Highway So., Seattle, Wash. 98188.

MOTORCYCLES, BICYCLES, MOTORSCOOTERS AND SUPPLIES

MINIBIKE \$10. Cushman \$10. Honda \$30, less engines. Kart complete \$10. Minibike \$20. Cushman \$25. Engines \$3.00 up. (mail order only.) Send 25¢ (35¢ for first class mailing) for directory - catalogue number 129, listing these and hundreds of similar bargains, homebuilders plans, parts, etc. Midget Motors Directory, Athens, 1 Ohio.

BUILD Motorbike from Bicycle! Plans, \$1.00. Go-Byk Industries, Rothsay, Minnesota 56579.

MINI-Bike plans, \$1.00. W. Johnson, 3812 Allison St., Brentwood, Md.

HARLEY-Davidsons — Used bargains. New, used parts, accessories, all models. Bulletin 35¢. Knuth's (Factory Dealer), 1753 Muskego, Milwaukee, Wis.



AVIATION

BE A Government licensed aviation me-chanic. Practical training. Free information. Aero Mechanics School Municipal Airport, Kansas City 16, Missouri.

HOMEBUILT. Real enclosed helicopter. 24 pages ideas, information, \$2.00. Build "executive" helicopter, drawings, specifications, \$1.50. Helicopter Development, Box PM147, Washington, New Jersey.

BARTLETT Flying saucer. Amazing machine hovers 200 lb. man across land, water, powered by ordinary lawn mower engine. Complete plans/kit info, \$3.00. Write: Herb Bartlett, Box 367-C, Silverdale, Washington.

AUTOGYRO - Snowsied - aircraft - air-boat propellers, plans, supplies. G.E.M. drawings, engines, 6-blade fans. McCulloch engine parts, Experimental, novelty, test propellers. Catalog, drawings, parts breakdown, \$1.00. ESCO-P, Brookport, Illinois.

MANCARRYING Kites! "The Giant Kites" tells how. Fully illustrated, \$1.00. Omega Press, Box 613C, Tustin, California 92680.

SKYDIVERS. Your photo reproduced on lighter. Details free. 6242 Calumet, Hammond, Indiana 46324.

PROPELLERS. Plans, kits, supplies for airboats, snowplanes. Gauges, spark plugs, gas-oil hose, oil coolers, primers, wrenches, switches, propeller hubs, engine mounts. Corvair-Volkswagon conversion parts, 125-190 Lycoming engines, manuals, gaskets, parts. Catalog, \$1.00. Banks-Maxwell, Box 3301E, Ft. Worth, Texas 76105.



BOATS

SPORTSCRAFT Canoes, factory direct. Four canvas covered kit models, under \$25.00. Uncomplicated assembly. Free information. Sportcraft, Box 4393-P, Columbus, Ohio 43201.

HYDROPLANES. Runabouts, inboards, outboards. Ski and class. Plans, kits or complete. Big catalogue, 25¢. Champion Boats, Dept. 10J, Box 9215, Long Beach, California.

KAYAKS — One-man \$19.50; two-man \$24.50; Sailboat \$42.00. Exciting Sitka Kayak Kits known world wide for speed and safety. Assemble in one afternoon. Free pictorial literature. Box 78-P, Brecksville, Ohio 44141.

BOAT Kits. Factory molded fiberglass or pre-assembled plywood, 50 models, 12" to 40'. Runabouts, Cruisers, Houseboats. Free catalog. Luger, Dept. BC-66, 9200 Bloomington Freeway, Minneapolis, Minnesota 55431.

BOAT PLANS, full size patterns, and frame kits especially prepared for amateur builders. Save the "Glen L" way by selecting from modern up to date designs—Deep Vee's and SK styled inboards and outboards, cruisers, houseboats, sailing catamarans. Every type from 8' to 35'. Huge new 80 page catalog, 50¢. Glen Designs, 9152 Rosecrans, Bellflower, Calif. 90707.

FIBERGLASS Canoes. Three exciting models. Easily assembled kits, \$34.95 up (factory direct). Free literature. Riverside Canoes, P.O. Box 5595BP, Riverside, Calif.

DC-14 CATAMARANS. We have an attractive money-saving and money-making proposition for sailors who would like to own and show off our fabulous DC-14 Phantom racing sloop in exclusive territories. Write Duncan Sutphen, Inc., 342 Madison Avenue, New York, N.Y. 10017.

FREE Catalogue—dozens of plans for kayaks, canoes, sailing rigs. Bruce Clark, PM, 115 McGavock Pike, Nashville, Tenn. 37214.

FULL Size, cut-to-shape boat patterns, blueprints. Send 60¢ for big new illustrated "Build a Boat" catalog includes fishing boats, garvies, cruisers, catamarans, houseboats—outboards, inboards, sailboats—7½ to 38". "How to Build a Boat" booklet, \$2.50. Cleveland Boat Blueprint Co., Box 18250, Cleveland, Ohio.

PLANS & Patterns, frame kits, boat kits, world's largest catalog over 200 proven designs including 40 new complete Boat Kits, fishing boats, cruisers, sailing, ski boats, houseboats, inboard and outboard hydroplanes. Send \$1.00 for large 1967 catalog or \$2.00 for catalog plus boat building handbook to Clark Craft 1709-P, Niagara Street, Buffalo, New York 14207.

SAILS U.S. dacrons custom or make your own. Instructions, \$2.00. Materials available. Bowen, 10 Pitfield, Agincourt, Ontario, Canada.

CLOSEOUT!! Construction plans for self-contained submersible scuba and salvage platform, \$2.00. Engineering Enterprises, Box 10445, Denver, Colorado.

FIBERGLASS Cloth and resin. World's finest cloth and non-run resin, at direct mill prices. Flotation foam. Complete line of plastics, silicon bronze and brass screws, save 60%. No sales tax. Boat Plans. Free catalogue. Freight prepaid. Stiles Boat Supply Box 11P, Linden Ave., Mantua Hts., N.J.

BUILD Your own boat from our large-scale blueprints. Books of plans give how-to-build help. Hundreds of professional designs—motor, sail or auxiliary—for amateur builders. Free catalog. MoTor Boating, 959 Eighth Ave., Dept. RS, New York 18, N. Y.

MARINE EQUIPMENT AND SERVICES

CONVERT Auto engines to marine. Catalog, 50¢. Lehman Manufacturing Company, 800 Elizabeth Avenue, Linden 4, New Jersey.

FIBERGLASS Cloth, matt, polyester and epoxy resins. Lowest prices. Seifert's, Box 1206-M, Green Bay, Wisconsin.

MARINE Engine kits for Chevrolet, Ford, Buick, Pontiac, etc. Water cooled manifolds—Transmissions—Send for information. Star Marine Engine Works, Berkeley 10, California.

NEW. Used, rebuilt marine motors. Marine conversions, fittings. Free catalog. Stokes Marine Supply, Dept. 24, Coldwater, Michigan.

ATHLETIC AND BODY BUILDING COURSES

"GIANT Arms." Dr. Young's, D.C. revolutionary discovery, \$2. Satisfaction or refund. Gaucho, Box 9309-S7, Chicago 90.

FEAR No bully! Master authentic Chinese Kungfu unbeatable techniques! Defeat within seconds any attacker including giant Judo-Karate experts. Free details by air. Write Asia's Greatest Master, Leong Fu, (MI/15) 119 Anderson Road, Ipoh, Malaysia.

KARATE—Complete instructions, illustrated, only \$1.25. Bales Co., Box 5050, Rt. 2-PM, Escondido, Calif. 92025.

SECRET Fighting methods from Army expert, \$1.98. Satisfaction guaranteed. Colonel Van Fleet, 3104 Lomita, Springfield, Missouri 65804.

BAR BELLS, Exercise equipment, key to health, strength, physique, 25¢. Reading Barbell Co., West Reading, Pa.

POWERFUL Muscles fast! Free brochure! Universal, Box 4327-C, Northeastern, Dearborn, Michigan 48126.

SPORTING GOODS AND EQUIPMENT

BIG Money raising crickets and 12 inch African fishworms. Free literature. Carter Ranch, Plains, Georgia.

SEND \$2.00 For 300-page shooting supplies catalogue. Quality gunsmithing—Lowest prices. Western Gun & Supply, 3730 N. 56th, Lincoln, Nebraska.

FREE Catalogs. Hunting, fishing, jewelry, gifts, photography. Brand name merchandise at Lowest Discount Prices. Charge it. Specify Catalogs Desired. Include Zip. Parker Distributors, 40 Industrial Place, (Dept. PM-96) New Rochelle, N.Y. 10805.

SILENCERS: Pistol, rifle details, diagrams, simpler, cheaper! Plus new design for .22s \$1.00. Twin, Box 192-A, Dunellen, New Jersey 08812.

FREE! America's largest sporting goods discount catalog & reference book, bigger & better than ever! More hunting information, proper gun selection, reloading and ballistics of the world's newest cartridges. Pages of guns, ammo., scopes, reloading, equipment, camping gear, fishing tackle and innumerable items for every hunter, shooter or sportsman. Maryland Arms Company, Inc., Box 7888, Dept. PM8, Baltimore, Md.

HUNDREDS Of Army-Navy surplus items, camping, hunting, fishing equipment, gun accessories, etc. Write for free catalog. P&S Sales, Box 115, Tulsa, Oklahoma.

FREE L. L. Bean, fall catalog—100 illustrated pages of practical hunting, fishing, camping specialties, clothing and footwear for men and ladies. Write L. L. Bean, Inc., Dept. 13, Freeport, Maine 04032.



FISHING, TACKLE, LURES

MOLDS For fisherman's sinkers, jigs, squids, casting and spinning lures. Free catalog. Sweet's Molds, Tonawanda 1, New York.

OVER 5,000 Hard-to-find fishing specialties and kits galore. Send for free 170 page catalog. Neteraft Co., Dept. PM, Toledo, Ohio 43613.

REVOLUTIONARY New fish de-hooker. Complete with instructions only \$1.00, guaranteed. Ami-Flip, Inc. Box 297, Clearwater, Florida.

FREE Wholesale catalog. Beads, Spinners, Lure parts, Sinkers molds, Jigs, Reels, Finnyports (ME). Toledo, Ohio 43614.

EARTHWORMS, LIVE BAIT

MEN!—Women! Make money raising Bait for us at home. Wigglers, Warsaw 45, Indiana 46580.

HYBRID Redworms 1000—\$3.00, 3000—\$5.75, 5000—\$8.00, 10,000—\$14.00. Bedrun 20,000—\$19.00. Postpaid with raising instructions. Brazos Worm Farms, Route 9, Waco, Texas.

EARN Money raising fishworms for us! Exciting details free! Oakhaven—56, Cedar Hill, Texas.

SUCCESS For you! Raise Carter's Pure-bred hybrid red wiggler fishworms, crickets. "Known All Over the World." Write for free literature and our success story in Life Magazine. Pure-Bred Fishworms—3000—\$5.95, 5000—\$8.95, 10,000—\$16.95. Postpaid with Free Raising Instructions. Carter Redworms, Plains, Georgia.

FROGS, FISH, REPTILES

FROG Raising. Young frogs and giant breeders. Stock your lakes, pond. Nu-Tex Frog Farm, Box 4029, Corpus Christi, Texas.



HUNTING, GUNS, DECOYS

GUNPOWDER! Make money, save money. Make your own gunpowder. For detailed instructions send 50¢ to: Hagenfeld Co., P.O. Box 163, Whitewater, Wisconsin.

SHOOTER'S Specials: 7mm Mauser rifles, \$19.50. 7mm, 8mm Mauser M98 Rifles, \$29.50. Ammunition \$5.00 100. Federal Arms, 928 Biscayne, Miami, Florida.



DOGS AND KENNELS

TELL The more than 1,400,000 avid readers of Popular Mechanics about your products and services. It costs very little to place your classified message in front of these proven mail order buyers. For further details, write: C. A. Martin, Dept. 14N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.



GAME BIRDS

YOUR Ad in this space will be read by more than 1,400,000 active mail order buyers. Join the march to greater profits, place your products and services in front of them today with a small low cost classified ad. For further details, write: C. A. Martin, Dept. 15N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

RABBITS—FUR BEARING ANIMALS

RAISE Rabbits successfully by knowing facts. 48 page illustrated book describing 25 breeds. Housing, breeding, feeding, markets, marketing etc. 25 cents. American Rabbit Association, 36 Arba Building, Pittsburgh, Penn.

RAISE Rabbits for us on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

MINK Raising information free. Lake Superior Mink Farm, Inc., Superior EE1, Wisconsin.

EARN \$10,000 Yearly raising Angora rabbit wool for us. Particulars 25¢ coin. Angora, Malta 12, Montana.

PETS—BIRDS, CATS, HAMSTERS, ETC.

ALLIGATORS—babies, guaranteed live lots of fun. \$4.00 Prepaid. Tropical Treasures Box 735-PM, South Miami, Fla.

LIVE Seahorses, marine specimens, aquarium supplies. Illustrated catalog 15¢. Marine, Box 243-110, Danja, Florida.

GERBILS! Newest pets! Copyrighted booklet, \$1.00. Details free. Robinson, 940-PM General Stuart, Virginia Beach, Va. 23454.

HAWKS, Reptiles, raccoons, skunks, squirrels, Catalogue 25¢. Trails End Zoo, St. Stephens, S.C.

MAKE Money raising chinchillas, mink, rabbits, caviar for us. Free catalog. Keeney Brothers, New Freedom 2, Penna.

CAMPING EQUIPMENT AND TENTS

CAMPING Equipment, tents, sleeping bags. Tremendous selections. Free 100-page Catalogue-Handbook. Include your Zip code. Morsan, 810-R Route 17, Paramus, New Jersey 97652.

EMBLEMS, BRASSARDS, PATCHES

FLAG For Servicemen's families. \$2.00. United States Publishing Corp., Stuart, Fla. 33494.

CLUB Emblems embroidered to your order. Ideal for club recognition. Low minimum. Send your design for free price quotation. Write for free catalog. Eastern Emblem Mfg. Corp., Dept. PM, P.O. Box 628, Union City, N.J. 07087.

TRAVEL AND RESORTS

YOUR AD in this space will be read by more than 1,400,000 active mail order buyers. Join the march to greater profits, place your products and services in front of them today with a small low cost classified ad. For further details, write: C. A. Martin, Dept 19N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

ELECTRICAL SUPPLIES

LAMP Parts. Catalog, prices, wiring instructions. 50¢. Refunded first order. Gyro, 5208P N.W. 35 Ave., Miami 42, Fla.

METERS—Surplus, new, used, panel and portable. Send for list. Hanchett, Box 5577, Riverside, Calif.

BATTERIES, GENERATORS

COMPLETE Rebuilding Manuals! Batteries \$3.00. Hydraulic jacks \$3.00. C.O.D. accepted. Bayer Publications, 938 Betty Avenue, Neenah, Wisconsin.

BATTERY Reconditioning kit, includes molds, material, complete instructions. The Battery Shop, P.O. Box 477, San Marcos, Calif.

ENGINES, MOTORS, DYNAMOS

REWINDING Specifications, 300 motors \$1. Modern, Box 10025, Kansas City, Mo. 64111.

WINDING Data, 275 motors, single and three phase \$1.10. Data Company, 512 Kensington, Kansas City, Mo. 64124.

AIR Compressors from mower engines. Simple, inexpensive. Showalter, Box 409B, Abilene, Kansas 67410.

DIESEL Injector parts and fuel pumps wanted. GM51-53-71-110. Bares, 2093 East 19 Street, Cleveland 15, Ohio.

MACHINERY, TOOLS AND SUPPLIES

"RAFTERULE" Solves any rafter cutting problem. Free literature. Emmert, Sycamore, Illinois 60178.

MICROMETERS — Indicators, cutters, chucks, drills, rods. Campbell's, 1424 Barclay, Springfield, Ohio 45505.

MACHINISTS. Toolmakers Chests. Circular free. Cepuder, 4715 Spencer, Lisle, Ill. 60532.

DIRECT Prices on 3 face hammers. Other new items carried. Free literature. Hex-tell Implement Co., Elburn, Ill. 60119.

MAGNETIC Chuck V blocks & parallels, edge finders, center finders, thread measuring wires, sine bars. Hi-precision—first quality—low prices. Factory distributors wanted. Be the dealer in your locality. Buy for yourself and sell to others. Liberal discount, products guaranteed. Est. 1943. Write for brochures. Fisher Machine, 11704-Minglewood, Hawthorne, Calif. 90250.

WELDING, SOLDERING, PLATING

A.C. WELDERS, 150 Amperes, \$49.50. Morris, 1070 Inner, Schenectady, N. Y. 12303.

FREE Catalog Welders, Kits. Build 350-ampere Welder. Plans. 25¢. Le Jay Manufacturing, Belle Plaine, Minnesota 56011.

CHROME Plating equipment, supplies. All other finishes. Home workshop and production sizes. Send \$1.00 (refundable) for formulas, operating data, equipment guide and catalog. HBS Equipment Division L50, 3543 East 16th, Los Angeles, Calif. 90023.

GOVERNMENT SURPLUS

JEEPS Typically from \$53.90 . . . trucks from \$78.40 . . . boats, typewriters, airplanes, sporting equipment, used, 100,000 bargains direct from Government nationwide. Complete sales directory and surplus catalog, \$1.00. Deductible first \$10.00 order. Surplus Service, Box 820-A, Holland, Michigan 49424.

JEEPS From—\$52.50. Typewriters from—\$4.15, cars from—\$31.50. Walkie-Talkies, Guns, Airplanes, Boats. Typical "As Is" Bid Bargains From Uncle Sam. Tremendous variety. Exciting free list. Write: Enterprises, Box 402X14, Jamaica, New York 11430.

CHEEP Jeeps. Buy from Gov't. Full information, 25¢. Box 789TPM, York, Penna.

CHEEP Jeeps, \$53?? (Repairable) Buy one or hundreds From U.S. Surplus. Official information plus Free Surplus Catalogue, 50¢. Box 9TFPM, Abbottstown, Penna.

JEEPS From \$50.00 Many other bargains direct from Gov't. Complete "buying directions" plus our "color" Surplus and Camping Catalog. Send 25¢ handling. Quality Surplus PM9, 2546 W. Michigan, Indianapolis, Indiana.

SURPLUS—Army, Navy store Illustrated catalog. Ruvel & Company's, Mail Order Division. Send 25¢ stamp or coin (refundable with first \$5.00 order). Ruvel, 707 Junior Terrace, Dept. 9-J, Chicago, Ill. 60613.

GOV'T. Surplus. How and where to buy in your area. Send \$1.00. Surplus Information, Headquarters Building, P.M., Washington 6, D.C.

HOBBIES AND COLLECTIONS

50 JUNGLE Butterflies \$2.00. 65 Oriental seashells \$6.50. Giant nature hobbies catalog 25¢. Collectors Wonderland, Box 1170, New York 8.

AMERICAN Newspaper, complete, original, dated before 1880. \$1.50. 25¢ stamps brings catalogue. D. R. Spaight, Book-seller Tall Timbers 1, Maryland 20690.



STAMP COLLECTING

RUSSIAN Space set 10¢. Russian approvals. Snedco, Box 68-F, Waldwick, N.J.

50 DIFFERENT Old U.S. Revenue stamps 50¢. Winchester stamps, Box 1592, Mansfield, Ohio 44907.

FREE! Congo triangle set! Boy Scout beauty! 25 others, different. Approvals. Cambridge, Box 411, Cambridge, Ohio.

100 OLD United States between 1861 and 1935, \$1.00. Roush Stamps, 51 Chestnut, Mansfield, Ohio.

225 STAMPS For only 10¢! This mammoth value includes airmails, pictorials; stamps from strange countries cataloging up to 25¢ each! Also approvals. Mystic Stamp Company, Camden 80, New York.

500 DIFFERENT Stamps, \$1.00. Smith, 508-A Brooks, College Station, Texas.

PENNY Stamps! 1500 Mounted in book at 1¢ each. Trust Stamp Company, P.O.B. 132-P, Jamaica, N.Y. 11435.

ONE Pound value Geo. VI Bermuda, plus 100 worldwide 10¢. approvals. Stevens, Box 105A, Homcrest Sta., Brooklyn 29, N.Y.

60 DIFFERENT U.S. (30 commemoratives) 25¢. No approvals. Seidenberg, Salem 169, Oregon.

AMAZING OFFER! 200 United States stamps—including commemoratives, airmails, high denominations to \$1.00. Only 10¢ to approval applicants! Illustrated bargain lists free. Mystic Stamp Co., Dept. 80, Camden, New York.

PENNY! Approvals! Regardless catalogue! Kloster, 4164 52nd St., San Diego 5, Calif.

64 PAGE U.S. and U.N. catalog free. Stone, 260 Washington, Boston 8, Mass.

FREE Sample. Interesting. Illustrated, informative National Stamp News, Anderson, South Carolina 29621.

INTRODUCING Our better United States approvals we offer 15 United States stamps including Columbian, Bi-Centennials, famous American, airmails, others: only 10¢. Ocean Stamps, Box 64-PM, Brooklyn 29, New York.

UNITED States commemorative collection containing 33 different—10¢. Approvals. White, 516-A Avenue L, Brooklyn 39, New York.

UNITED STATES price list, 132 pages, price 30¢. Mark Hanna, 335 Fifth Ave., Pittsburgh 22, Pa.

121 DIFFERENT Flag stamps free. Approvals. W-B Stamps, Wilkes-Barre, Pa.

U.S. Mint specials! Flag set, complete \$1.00. 1¢, 2¢, 3¢ famous Americans (21 different) \$1.00. Free list. Brooks, 2601 Avenue "U", Brooklyn 29, N.Y.

U.S. Approvals, Low prices. Eagle, 2221 Romine Ave., Pittsburgh 26, Pa.

GERMAN Commemoratives, 10¢ with approvals. Schaefer, Box 1704, Washington 13, D. C.

WOW! 110 All different Germany 10¢ Commemoratives, Airmails, high values, big catalog, bargain lists plus selections of fine stamps from our approval service, returnable without obligation. Jamestown Stamp, Dept. A96PM, Jamestown, N.Y. 14701.

FREE! Big bargain catalog—new edition listing thousands of bargains including U.S. & B.N.A. stamps, packets, albums, accessories and supplies. Plus selections of fine stamps from our approval service, returnable without obligation. Jamestown Stamp, Dept. E96PM, Jamestown, N.Y. 14701.

50 DIFFERENT U.S. Commemoratives 25¢. No approvals. Earl Mills, Box 272-K, Auburn, Mass. 01501.

FREE 1966 U. S. list, mint #704-15 \$4, #740-9 \$2.10, #859-99 \$6, #909-21 \$1. Simmy & Co., 40 Court St., Boston, Mass.

U.S. Bargain, 50 different 10¢. with beautiful worldwide approvals. Stamps, Kennebunk, Maine.

25 Different United States Commemoratives 1893 Up 10¢. Approvals. K. & B. Stamp Company, Box 70, Brooklyn 23, New York.

FIPEX—Tipex-Cipex-Ashville. Four miniature sheets used for \$1.00 if you ask for our bargain priced U.S. approvals. Triboro, 38 Park Row, New York, New York 10038.

"COLORFUL" Set free! Worldwide approvals. Gorliz, Drawer 388PM, Park Ridge, Illinois.

MILLION Foreign stamps! 2¢ each! Send for thrilling, giant approvals! ABC Stamps, Box 6000-MB, San Francisco 1, Calif.

DEFECTIVE Old U.S. 1/5 Scott. Approvals. Swartz Stamps, Malden Bridge, New York.

NEW Issues — Free weekly illustrated list. Brooks, 2601N Avenue "U," Brooklyn 29, N.Y.

FREE Surprise collection sent with approvals. Gould, 1784 Union, San Francisco 94123.

FROM War torn Vietnam 50 scarce pictorials \$1.00. Approvals accompany. Merriam Stamps, PO Box 50, Somerville, N.J.

GIANT Stamp collection, including astronauts, satellites, moonrockets, boy scout issue, complete U.N. set, many Olympic and sport issues, etc., plus big stamp dictionary and approvals. Everything, 104 Stampex, Box 47-RM, White Plains, N.Y.

FREE Mint set, Approvals accompany. Stamps, Box 22092, Memphis, Tenn. 38122.

THOUSANDS Of worldwide sets and singles on approval. Highest quality! Cole, Box 223A, Buffalo, N.Y. 14221.

NEW Zealand triangle set. Free with approvals. Academy Stamps, P.O. Box 1747, Annapolis, Maryland 21401.

BREATHTAKING 50 Mint Monaco pictorials, multicolors. \$1.00. Approvals, Stamp Exchange, Box 103, Fairfield, California.

1500 FOREIGN \$1.00. 5000 \$3.00. 5000 USA—commemoratives, airm, high values, revenues, 19th Century, etc. \$3.00. No approvals. Meyers, 5321 Fleming, Richmond, California.

FREE! 110 British Empire stamps (worth over \$2.50 at standard catalog prices) when you send only 10¢ for mailing costs! Get this big, valuable collection—from Antarctica to Zambia! Spectacular issues picturing Conquest of Ice Continent, Papuan Cannibal, Flying Dragon of Wales; plus many others from Tanganyika, Sharjah, Dubai, South Georgia, Christmas Island, etc. A sensational offer to introduce you to world's most rewarding hobby. 110 genuine, all-different stamps plus special Free bonus—a complete set of England's 42 Kings and Queens. Also, selections of attractive and unusual stamps from our stamps-on-approval service for free examination. You may return selections without buying and can cancel service any time. Plus free "How to Recognize Rare Stamps" booklet, and big illustrated collectors' catalog! Send 10¢ to: Kenmore, Milford QR-53, New Hamp. 03055.

ABSOLUTELY Free 50 worldwide. Request inexpensive approvals. University Stamps, P.O. Box 326, Pompano Beach, Florida 33061.

50 YEARS Old, fifteen different United States, over fifty years old—10¢ with approvals. Jaxon, Box 143-P, Brooklyn, New York 11230.

RARE Stamp free. Also new packet Aden to Urundi, with Kennedy, Triangles, space, sports, ships, dogs, cats, reptiles, plus others. All free. Send 10¢ for mailing. Empire Stamp Co., Dept. PM, Toronto, Canada.

EGYPT (U.A.R.) 25 Different 5¢, Approvals. Hijop, Box 305, Norristown, Pa.

FANTASTIC Hippo, deer triangles! Valuable "Ben Franklin" on Canal Zone! Flaming bi-colored volcano triangle! Lovely olympics triangle! Plus icy Greenland, weird wild beast issue and others. 10¢ with approvals. Roseland Stamps, Spring Lake 2, Michigan.

"OLD GLORY" in flaming colors! U.S.A. flag giant beauty from Honduras. Enormous United Nations Mexican stamps Plus strange gorilla issue. Duke of Windsor, Morocco lovely Macao flowers, wild buffalo stamps and others. 10¢ with approvals. Sunny Stamp, Fruitport 2, Mich.

TERRIFIC 1¢ and 2¢ approvals. Thousands available. Thoms' Stamps, P.O. Box 456-PM, Richmond, Indiana 47374.

FREE Premium—U.S. used lists. Stampcraft, 2831 Beacon Hill, Ann Arbor, Michigan 48104.

FREE Bahamas olympics set, with approvals Moulblow, 19B Cedarhill, East Northport, New York 11731.

SELECTED U.S. approvals. Brunner's, 121 Glen Moore Circle, Lancaster, Penna. 17600.

FREE! 25 different New Zealand. Approvals. Weiss, 2021P Alcazar, Hollywood, Florida 33023.

U.S. Overrun countries complete mint. \$1.00, approvals. Stamper, 2013 San Salvador, Fairfield, California 94533.

40,000 DIFFERENT. Amazing new plan builds your collection systematically, country by country. As low as 50¢ weekly. Ware, Monroe 75, Conn.

100 DIFFERENT! Free! 1/4¢ upward British Commonwealth or world approvals. Bush, Newlyn Way, Poole, England.

LARGE Pictorials, commemoratives free with approvals. Wischart, Dept. 10, 48 North Powell Avenue, Columbus, Ohio 43204.

TRIANGLES!! Twelve exotic birds, insects, flowers!! 5¢. Approvals. Hamilton, 7156 South Cyril, Chicago, Illinois 60649.

450 FINE Mixed U.S. 15¢. Wright, Box 753-M, Hagerstown, Maryland.

PENNY Approvals, large selections: Premiums with Purchases. Penny Stamps, Orange, California 92669.

ONE Cent a stamp. Write for a jumbo book of foreign stamps at 1¢ each, mounted in Scott order. Bullet Approvals, 6815A Bay Parkway, Bklyn, N.Y. 11204.

500 "COLORFUL" Stamps \$1.00! Approvals. Garlitz, Box P-388, Park Ridge, Illinois 60068.

UNITED Nations 4 Pictorials free to approval applicants. Morrell, 161 No. Whitney St., Hartford, Conn. 06105.

U.S. Mint fine parks imp. 2.50 perf. 2.00. Cooper, Box 3751, Oak Park, Mich. 48237.

ZOO Parade, elephants, lions, monkeys—Bulgaria's latest commemoratives. Free! Approvals plus 10¢ bonus sets. William Deems, 226b Race, Ravenswood, West Virginia 26104.

US #398 PANAMA Pacific 1912, + 15 diff. U.S. only 1 dime, approvals. Ciovacco, 179 Park Ave., B'klyn, N.Y. 11205.

200 DIFFERENT Worldwide 10¢ with approvals. Bydahl, Box 1293-MCI, Seattle, Washington 98111.

DEALERS—Wholesale Stamp list. 5¢. Frank, 5031 Queensberry, Baltimore, Maryland 21215.

12 HITLERS. Mint set. 10¢. Approvals. Gallerys, Box 35291, Los Angeles 90035.

TEN Different Nudes: 20¢. Approvals. Stamp Farm, 2M13, Oxford, Wis. 53952.

FREE Space collection with approvals. Tiquet, Box 1496, Denver, Colorado 80201.

25 DIFFERENT Russia, 10¢ with approvals. Phipps, 10865 1/2 Wellworth, Los Angeles, 90024.

25 JAPAN (Cats, \$1.17) 10¢. Free lists over 1850 collections. Dowling, 51 Stratford, Brooklyn, New York 11218.

ADVANCED Collectors!!! Quality foreign approvals 1/2 catalogue! Roth, Walker, W. Va.

BREAKING Up dealer's estate into small "lots." No approvals. Incredible bargains! Just send postcard to: Popstamps, Valrico, Florida 33594.

"INVERTED Error." Dag Hammarskjöld 5¢ with Approvals. Belmont Stamps, Washington, D. C. 20015.

COINS, TOKENS, CURRENCY

GIGANTIC Coin Clearance. Illustrated lists 10¢ (refundable). Hutchinson's, Box 6256, Philadelphia, Pa. 19136.

SPECIALS: Scarce date Lincoln cents. All good or better. Satisfaction guaranteed. 50¢ each 1916S, 1927S, 1939D, 1955S. 75¢ each 1915, 1915D, 1921S, 1924S, 1932, 1932D, 1933. \$1.00 each 1909VDB, 1913D, 1923S, \$1.50 each 1911D, 1912D, \$3.00 each 1913S, 1922D, 1931D, 1933D. \$4.50 each 1910S, 1915S, 1926S. \$5.00 each 1912S, 1914S. \$10.00 each 1911S, 1924D. Bryson Inc., 612A White, Toledo 5, Ohio.

SILVER Dollars uncirculated. 1878-79-80-81-82 S mint \$3.00 ea. Illustrated Catalogue 50¢. Shultz, Salt Lake City, Utah 84110.

OLD Time Lincoln cents, 15 different before 1931 only \$1.00. Gene Carlton, Chandler, Okla. 74834.

LARGEST Coin magazine. 200 pages, 50¢ Scrapbook. 7320-J Milwaukee, Chicago 42.

40 PAGE Illustrated United States and Canadian coin list 10¢. Stoney, 260 Washington, Boston 2, Mass.

LINCOLNS: 22 Different "S" including rare 1955S, \$1.60, 28 different before 1940, plus odd 1960D small date, \$1.60, 10 different "S" Jefferson nickels, \$1.60. All three \$4.50. Harris, 3354-P El Camino, Santa Clara, California 95051.

REVISED Catalog now ready. 50¢ with refunding certificate. Hobby Sales, St. Paul, Minnesota 55118.

FREE Coin supplies! Giant coin list 20¢ (refundable). Economy Sales, Mansfield, Massachusetts.

WE Pay \$200 for 50 Lincoln Pennies! Send \$1 for Lincoln Penny Album. When filled with proper dates & marks (as shown in album), return it. Money paid by return mail. Centre Coin Co., 13631-I Ventura, Sherman Oaks, Calif. 91413.

TRUCKFUL 25,000 Indian-Lincoln cents from 1920's & older, mixed "grab-bag" style. 150—\$10; sample bag of 30—\$3. Mrs. H. Fisher, Box 5490, Sherman Oaks, Calif. 91413.

CALIFORNIA Gold pieces. Five different halves and quarters \$3.50, dollar size \$2.00. All six pieces \$5.00. Coffman, Box 27034, Indianapolis, Indiana 46227.

BEAUTIFUL Uncirculated Foreign dollars: Bermuda, Canada, Churchill, each \$1.65. Austria, Norway, Panama, Sweden, each \$2.75. Deluxe Album \$3.50. World's greatest bargain catalogue, \$1.00. Bebee's, Incorp., 4514 North 30th, Omaha, Nebraska 68111.

COIN Date guaranteed. Restores dates on worn nickels, \$1.00 bottle. Box 276F, Mooreville, N.C.

INDIANS: Bargain 4 for \$1.00. USCCO, Box 638, Amityville, New York.

INVESTORS—Dealers brill. Uncirculated rolls cents 1956-P \$4.50 1956-D \$1.75, 1957-P \$3.50, 1957-D \$1.50, 1958-P \$3.50, 1958-D \$1.50, 1959-P \$1.50, 1959-D \$1.25, 1960-P \$1.40, 1960-D \$1.25, 1961-P \$1.25, 1961-D \$1.25, 1962-P \$1.25, 1962-D \$1.00, 1963-P \$1.00, 1963-D \$1.00, 1964-P \$1.00, 1964-D \$1.00. Ray's Coins, Dept. PM, Streator, Ill. Send postcard for our Free mailing list.

DISCOUNTS. Buy, sell, trade lists. 10¢. AWM Coins, Box 14377, Orlando, Fla.

AMERICAN Obsolete coins over 100 years old. \$2.50 each. Large cent: 2-cent piece: 3-cent piece: half dime: copper nickel cent. Raroca, 31 North Clark, Chicago 60602.

UNUSUAL Molded in plastic Lincoln Memorial Set B.U. 1959 1965 PD. Lifetime guaranteed \$1.00. Coins, Box 11584A, Ft. Worth, Texas 76110.

GENUINE 1863 North Carolina 5¢ bill uncirculated \$2.00. Coin lists free. Sayers, 1000 Unaka, Johnson City, Tennessee 37601.

SALE! Free "hot list" terrific bargains! Fairway, 121-P, Rye, New York 10580.

BARBER Dime, quarter and half, \$2.00. Doktor, 5025 W. Pico, Los Angeles, Calif. 90019.

SILVER Dollar, \$1.75; flying eagle cent, \$3.00; Civil war token, \$3.25; all three \$7.75. Nelson, 346-P Rye, New York 1058J.

HIGHEST Prices paid immediately for coins. Send 10¢ for 1967 buying prices. Wilmot's, 1067-F Bridge St., Grand Rapids, Mich., 49504.

ANTIQUES, RELICS, INDIAN GOODS AND CURIOS

ARROWHEADS. 10 for \$3.00. List free. Hyde's, Box 1788, Santa Fe, New Mexico.

10 ASSORTED Perfect arrowheads. \$3.00. George Smith, 9825 Conway Drive, Indianapolis, Indiana 46236.

TONS Of antique gun parts and supplies. All reproduction muzzle loading guns. Send \$1.00 for enlarged illustrated catalog No. 115. Dixie Gun Works, Union City 12, Tennessee.

SELLING 20,000 Ancient arrowheads, spearheads, etc. List free. Lear's, Glenwood, Arkansas.

START Your own thrilling collection! Internationally famous antique, museum, Indian, curio replicas! Illustrated catalog, \$1.00—refunded first order! International Industries, Box 8181-BI, Pittsburgh, Pa. 15217.

ANTIQUES! Monthly magazine. Sample 25¢ or free circular. Antiques Journal, Uniontown, Penna. 15401.

MODELS—SHIPS, TRAINS, PLANES, ETC.

SHIP Models. Kits, fittings, plans, books, tools, engines, motors. Big illustrated catalog. 50¢. James Bliss & Co., Dept. SM, Route 128, Dedham, Mass. 02026.

BUILDING Materials. 1/4" & 1/2" scale, windows, doors, siding, roofing, lumber and structural shapes. Send 35¢ for catalog with samples. Small Sales Co., 6025 Martway, Mission, Kansas 66202.

SHIP Model kits and fittings: clippers, frigates, etc. Catalog paint-tool list, book list, 40¢. Model Shipways, Box 65, Bogota, N.J.

ROCKETS: Real flying models—flights up to 2500 ft. New illustrated catalog 25¢. Single and multistage kits, cones, engines, launchers, trackers, rocket aerial cameras, technical information. Fast service. Estes Industries, Penrose 2, Colorado.

ROCKET Or fireworks fuse 3/32" diameter, water proof 25 feet, \$1.00-125 feet, \$4.00 postpaid. Zeller, Box 639, Hudson, Michigan.

LIVE Steam engines, boilers, accessories. Catalog. 65¢. H.P.K. Models, Box 34, Centuck Station U, Yonkers, New York.

STEAM Engines, castings, machined, finished, stuart, craters, 6 hp compound, fitting tools, boilers, pumps, catalogue \$1.00. Denison Live Steam Models, Box 306, Darlington, Penn. 16115.

HOT Off press! Many new items! Also our conventional steam, gasoline Corliss, Fire Engines, Case Tractor, Boilers, Accessories. Beautifully illustrated 100 page Catalog \$20, \$1.25. Cole's Power Models, Ventura, Calif.

SHIP and yacht model fittings; Pine construction hull kits: blueprints. Send 50¢ for illustrated catalog. A. J. Fisher, Inc., 1002 Etowah Avenue, Royal Oak, Michigan 48067.

GAMES, TOYS, NOVELTIES

MONACO, Anyone? Rules, details 25¢. Combo Playing Cards, Inc., 300 Griswold, Detroit Michigan 48226.

MAGIC TRICKS, PUZZLES, JOKER NOVELTIES

MAGIC Catalog. World's finest. 3000 tricks, (340) pages \$2.50. Beginners, amateurs, professionals. Kanter's, A-200 South 13th St., Philadelphia, Pa. 19107.

BE A Magician! Introductory catalog with free trick, only 35¢. Ireland Magic, 5082 Lincoln, Chicago, Illinois 60625.

500 TRICKS. Douglas famous catalog No. 36, only 10¢. Contains best in magic for pocket, parlor, club, stage. Fastest service to magicians for over 50 years. Douglas Magicland, Dept. 21, Dallas, Texas 75221.

COMPLETELY Illustrated catalog. 84 pages, 25¢. Manhattan Magic, Box 334-M, N.Y.C. 11.

WORLD'S Finest professional magic tricks. Joker's Novelties, Giant illustrated catalog 10¢. Top Hat, Evanston, Illinois.

FUN'n Magic catalog. 10¢. (1,500,399 tricks, jokes, novelties, puzzles, disguises). Elbee, 7408-P, San Antonio, Texas 78207.

164 PAGE Giant surprise catalog! Over 1000 tricks, professional magic, jokers!! World's greatest! 800 pictures! Special only 10¢. Vick Lawton's Magic, Dept. PM6, Northeast Fifth Ave., Ft. Lauderdale, Florida 33308.

GIGANTIC Illustrated Catalog 10¢. Tricks! Puzzles! Funmakers! Andersen's, Box 97-P, Park Ridge, Illinois 60068.

VENTRILOQUISM—Home study course by professional teacher. Dummies, dialogues. Write for details. P. Stadelman, 1449 Fargo, Chicago 26, Ill.

VENTRILOQUISM For fun or money. New method, easy. Robert Marlette, Roosevelt Rd. & Parkside 18, Sleepy Hollow Apt. 1-H, Glen Ellyn, Ill. 60139.

GIANT Magic Catalog and free trick only 10¢. Write today. Mailmart, M968, Box 616, White Plains, N.Y. 10602.

BOOKS, PERIODICALS

CHALLENGING! Different! Unusual books! Free catalog. Ruby's, D-26, Paradise, Pennsylvania 17562.

BOOKS, Free general catalog, 66 pages. Text, vocational, educational, instructional subjects. Millions of volumes, new and used. Bargain prices. Books bought, Est. 1902. Long's College Book Co., Dept. PM, Columbus 1, Ohio.

OUT-Of-print books at lowest prices! You name it, we find it! Fast service. No obligation. International Bookfinders, Box 3003-PM, Beverly Hills, Calif. 90212.

FREE Catalog. Self-help books. Write Wilshire, 8721 Sunset, Los Angeles 69P.

HIGHER Income, security and power. 256 page book "Thinking Big" reveals secrets that make men rich. Send \$2.00. Schoch's Mail Order Service, P.O. Box 267 Lynn, Mass. 01903.

PROPHET Elijah coming before Christ. Wonderful book free. E. Megiddo Mission, Rochester, New York 14619.

BOOKFINDERS! All subjects. Send wants! Sydney Jaher, 175-45 88 Ave., Jamaica, N.Y. 11432.

ZIP Code directories, \$1.00. International Industries, 22 East 17th Street, N. Y. 10003.

USED Courses, books. Catalog. 10¢. Courses bought! Bayles 78B Courtright, Wilkes-Barre, Penna. 18702.

GOLDMINE Of books, Science, self improvement, humor, mysteries, 15¢ each. 60 page catalogue 25¢ refundable. M&J Associates PM9, 142 Prospect Street, Trenton, New Jersey 08618.

FREE Brochure. Popular self-help books. Stahico, Box 10761, Jackson, Miss. 39209.

IMPROVE Your personality 110 page book dynamic thinking shows how send \$1.00. J. P. Looney, 301 McCord Street, Benton Harbor, Michigan 49022.

1,000,000 BOOKS! Bargains! Catalogs—dime. Bookanza, 6990 Aberdeen, Upper Darby, Penna. 19082.

SELF Improvement books. Free catalog. John Thompson, Box 1086-A, Black Mountain, North Carolina.

INTERESTING Books. Free Catalog. Postal PM, 2217 Lackland, St. Louis, Missouri 63114.

PLAYS, STORIES, MANUSCRIPTS

WANT Your book published? Learn how we publish, advertise, promote, distribute. Many successes. Free booklet PM, Vantage, 120 West 31, New York City.

WANTED Writers! Short stories, articles, books, plays, poetry. Will help place, sell your work. Write today, free particulars! Literary Agent Mead, Dept. C-32, 915 Broadway, New York 10, N.Y.

BUSINESS OPPORTUNITIES

IMPORT-Export opportunity, profitable world-wide, mailorder business from home, without capital; or travel abroad. We ship proven plan, for no risk examination. Experience unnecessary. Free details. Melinger, Dept. X709, Los Angeles 90025.

MAKE Money from old tires. Operators clearing \$400 weekly. Equipment costs \$600. Get facts. S & S Patents, Inc., 3511 N. Lincoln, Chicago 13.

READ Progressive Mailtrade, the magazine that tells how to make money by mail. Quarter brings sample and special offer. Mailtrade, P.O. Box 357, Sheboygan, Wis. 53082.

MAILORDER Catalogs. No inventory required. Discounts 40% up, postpaid. Send 25¢ for 32 page sample catalog, featuring 150 unusual, fast-moving products and complete details. Satisfaction guaranteed. Gaylords, North Adams 7, Mass.

BIG Money raising fishworms and crickets. Free literature. Carter Farms, Plains, Georgia.

\$400.00 MONTHLY Raising giant fishworms. Soilless method. Charlie Morgan, Bushnell, Florida 33513.

COLORGLAZED Concrete pottery made without molds. Patented method. Cemetery products, novelties, tiles. Basement leak-sealing. Money-making projects. Booklet, details free. Men only. National Potteries Company, Grand Rapids, Minnesota.

PROFITABLE Catalog Mailorder Business! Vikari's, 835-PM, First Avenue, Salt Lake City, Utah 84103.

START Your own business on credit. Your own boss. Hundreds of dealers making \$100 to \$300 and more weekly. We supply stocks, equipment on credit, 300 home necessities. Sales experience unnecessary. Pleasant, profitable business backed by world-wide industry. Write Rawleigh, Dept. 1-U-PPM, Freeport, Ill.

FREE Book "990 Successful, Little-Known Business." Work home! Plymouth-972J, Brooklyn, New York 11218.

BUILD Custom cases at home for profit. Get orders by mail. We supply materials, instructions, everything. Free home business details. Customcase, 805CPC, Sunset Los Angeles 12.

ADDRESSERS And mailers needed. Send stamp for information. Lindbloom, 1508 West Erie, Chicago. 60622.

VENDING Machines. No selling. Operate a route of coin machines and earn amazing profits. 32-page catalogue free. Parkway Machine Corporation, 715 PMB Ensor Street, Baltimore 2, Maryland.

OPERATE Home mailorder business. Vozacek Printing, 4144AI Ute, San Diego, Calif. 92117.

DOLLS! Dolls! Dolls! We teach you to repair, make, dress, also how to operate a Doll Hospital. Study at home. Earn while you learn. Or enjoy a fascinating hobby! Free informative booklet. Lifetime Career Schools, Studio MC-96, 11824 San Vicente Blvd., Los Angeles, Calif. 90049.

\$60.00 DAY. Manufacturing concrete parts. CAPLANE, 1803 Fremont, Rapid City, South Dakota 57701.

LEARN Landscaping and the growing of plants. Start a profitable business part or full time. Free information without obligation. Lifetime Career Schools, Dept. MC-96, 11826 San Vicente Blvd., Los Angeles, Calif. 90049.

HUGE Profits! Mail order importing. Free information. ITIS-PM-9, Box 454, Hollywood, Calif. 90028.

MAKE \$32 From 49¢ piece vinyl. PMA-1834 Edgeland, Louisville, Ky. 40204.

\$15.00 HOURLY Profit—Own Business with one serviceman. Quickly learned. Easy to do. Operate from home. Few hundred dollars builds your own nationally advertised business while continuing present job. Investigate immediately... before your territory is taken. Free booklet explains everything. Send today then decide. Duraclean, C6-168, Duraclean Building, Deerfield, Illinois.

400,000 BARGAINS Below wholesale! Many free. Liquidations... closeouts... job lots... single samples. Free details. Bargainhunters Opportunities, Box 730A, Holland, Michigan 49424.

VENDING Machine big catalog. Rake, 1214A West Girard, Phila., Pa. 19123.

SELL Advertising book matches. Write us today; we put you in business by return mail, handling complete line ad book matches in demand by every business right in your town! No investment; everything furnished free! Top commissions daily! Superior Match, Dept. MX-966, 7530 S. Greenwood, Chicago 19, Ill.

BOOKKEEPING System. Substantial profit selling Start Service, Kern, Box 263, North Hollywood, California.

SECRETS! Secrets! Mail order success revealed by internationally famous expert who discovered how to make home business fortunes. Beginners: Get free copy "How to Make Money in Mail Order." Discloses free advertising, profitable products, everything! No obligation. Write Mallico, 1554 Sepulveda, Dept. X709 Los Angeles 90025.

FREE Details—Start your own plastic laminating business. We supply everything. Jiffy, Box 23485P, Los Angeles, Calif. 90023

FREE "Franchise Profit Letter" tells how unique NFR service is helping thousands seeking profitable businesses. Write today. National Franchise Reports, W-528, 333 North Michigan, Chicago 60601.

PIANO Tuning learned quickly at home. Tremendous field! Musical knowledge unnecessary. Information free. Empire School of Piano Tuning, Box 327, Shenandoah Station, Miami, Florida 33145. (Founded 1925).

MAKE Extra money — show friends, neighbors—gifts, stationery, Christmas, all occasion cards. Experience unnecessary. Salable samples on approval, free catalog, free name imprinted Christmas card album. Hedenkamp, 361 Broadway, Dept. PM-90, New York.

PACKAGE At home for profit! We supply everything. No "selling." Free home business details. H.P.C-80THPC, Sunset, Los Angeles 12.

"MAIL-Order plan of the month." New service for those wanting their own Mail-Order Business. Free details. Vols-UN, Ypsilanti, Michigan.

FREE! 128 Page illustrated catalog. More than 2000 name brand items; below wholesale prices. Sell full or part time. Save hundreds of dollars on purchases for yourself! Watches, jewelry, cameras, radios, phonographs, tape recorders, appliances, housewares, cookware, hardware, power tools, luggage, musical instruments, sporting goods, toys, many others. Orders shipped within 24 hours. Continuous supply. Send for free catalog now! H. B. Davis Corp., Dept. PM 1177 Main St., Hartford, Conn. 06183.

\$200.00 DAILY in your mailbox! Your opportunity to do what mailorder experts do. Free details. Associates, Box 136-A, Holland, Michigan 49423.

BOOKKEEPERS Earn \$1000.00 month. Operate simplified Bookkeeping tax service. Universal, Box 664-M, Springfield, Missouri.

HELPING Hand to avoid mistakes in mailorder. Inquire: Seben Enterprises, 220A Fifth Avenue, New York, N.Y. 10001.

\$200.00 WEEKLY. Every business and professional man has No-pay accounts. Send them to us for collection. We pay you for each name listed. No collecting. Dept. PM-12 General Finance Company, Pickwick Bldg., Kansas City, Mo. 64106.

FREE! Furnished apartment, plus \$400-\$1,000 monthly salary, if qualified as Motel Manager. Live graciously, meet VIPs. Train at home. Earn diploma from approved school. Free placement assistance. Openings for men, women, couples. If over 21, write for facts. Motel Management, Dept. 206, 2433 N. Mayfair Rd., Milwaukee, Wis. 53226.

WANT To make big money at home? \$10.00 profit in an hour possible with invisible mending. Make tears, holes disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details free. Fabricon, 1585 Howard, Chicago, Ill. 60626.

\$70.00 WEEKLY—home, spare time. Simplified mail bookkeeping. Immediate income, easy. Auditax, 34741a, Los Angeles 90034.

CONCRETE Facts: Cement artists make big money at home. Simple equipment. Experience unnecessary. Unlimited unique pottery designs easily made without moulds. Birdbaths, Wishing-Well, Waterfalls, Rustic Gardens, Patio items, etc. Formulated chemical coloring, marble-glazing. Free illustrated Brochure, Hollywood Cementcraft, 602 Athens, Altadena, California, 91001.

RAISE Rabbits for us on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

WORLD'S Largest wholesale supply. Buy from 1853 American, European, Japanese wholesalers. Hong Kong tailormade suits. 123 dropship catalogs. Rockbottom prices. Automobiles. Free details. International Buyers, Post Office Box 4061, Colorado Springs, Colorado 80909.

SAVE 40%! Make your own professional rubber stamp manufacturing press! Parts list, photo-diagrams, instructions, \$1.00 (refundable). Garmac, 769 Rio Grande Bldg., Dallas, Texas 75502.

IMPORT-Export lucrative, two-way profitable business. Represent manufacturers, no investment. Free advertising in seven languages, 130 countries. Monthly dropship opportunities. Market Guides Japan, Hong Kong, Africa. Details 10¢. Benko, Box 188-A, New York 21, N.Y.

EXPLOSIVE!!! Mailorder business goldmine. Terrific! Money-making details free. Livingston's, Box 5332, North Charleston 1, South Carolina 29406.

GET Dollars in your mail! Start at home. Grow. Details free. Opportunity, Box 224-P2, Prospect Heights, Illinois 60070.

OPPORTUNITY To earn \$15,000-\$30,000 annually. Franchise protected. Guaranteed on \$15,000 basis. No merchandise to buy. Self employed. One of most exclusive and noncompetitive businesses in United States and Canada. Patent pending. Free 26-page brochure. Executives, P.O. Box 4080 APM, New Orleans, Louisiana.

MAKE \$46 From square foot plywood: jigsaw necessary. Free details. Woodart, Bridgewater, Mass.

FREE Literature mailorder business goldmine, it's terrific. Howies, 99 Forest, Centerport, New York.

INSTALL Burglar alarm systems. Big profit home business. Beginners start spare time, without mechanical experience or costly equipment. Free starter plan. NASCO, Dept. X709, 11071 Massachusetts, Los Angeles 90025.

LOW-Risk mailorder can easily net \$1,000 monthly. Free details. Gordon, Box 212A, Pompano Beach, Florida 33061.

LET Us act as your office. Mail, telephone messages, orders received—forwarded, \$10.00 Month. National Business Exchange, 150 Broadway NYC (212) CO 7-2911.

MAKE Money by composing perfumes! Monsieur Arno, internationally famous perfumer expert reveals perfume-making secrets. Make perfumes the first day after reading his revealing instructions. Experience unnecessary, no investment. Your cost 30¢, sell \$5.00. Perfume makers grow rich quickly. Over \$400,000,000 men's fragrances alone sold annually in U.S. today. Orle, P.O. Box 4408, San Diego, Cal. 92104.

LIQUID Molding rubber also liquid plastic. Free information. Chaney's, 5415-A San Jose Blvd., Jacksonville, Fla. 32207.

\$25.00-\$75.00 WEEKLY Possible. Addressing envelopes. Compiling names. (Longhand—typewriter) Details free. Superior, Box 721-A, Elkton, Maryland 21921.

COPUBLISH "Mail Sale Advertiser" leading mailorder paper. Copy and details 25¢. Vanroy Shirk, Lebanon, Pa. 17042.

STEAMLINED Mailorder course. Twenty-four different lessons, \$2.00 complete. Dealers wanted. Neil H. Tasker, Shamokin, Pennsylvania.

BAKE New greaseless doughnuts in kitchen. Stores buy output. Start spare time. Profit 29¢ dozen. Small appliance. Free recipes. Montgomery Ray, Waseca, Minnesota 56093.

MAILORDER—Profitable items, dropshipped. Everything supplied. National Mdrs., 3408½ Motor, Los Angeles 90034.

TOP-Pay custom upholstery career. Automation-proof skill opens doors to cushy, prestige, secure positions or your own business. We teach you how to upholster chairs, divans, footstools, autos, etc. Make custom furniture, turn old into new. Countless profitable opportunities. Learn quickly and easily at home. Free career booklet. Modern Upholstery, Institute, Box 899-DK, Orange, Calif. 92669.

BONSAI Tiny trees. Home study course teaches you. Make beautiful prize artificial trees, arrangements. Grow valuable living miniatures too. Spare time—full time. Big profit. Free tree offer. Free fact pack. Minifree, Dept. AJ, 12303 Hawthorne Blvd., Hawthorne, Calif. 90250.

MAKE Money mailing our postcards! Work home, full, sparetime. Particulars, 10¢. Westlee, Western Springs 1, Illinois.

I MADE \$40,000.00 year by mailorder! Helped others make money! Start with \$10.00. Free proof. Torrey, Box 63566-Y, Oklahoma City, Oklahoma 73106.

I WORK at home—made \$10,000 first year. Secret free. Ventures-331, Harlingen 1, Texas.

FREE Monograph exciting mailorder opportunities. Frank, Box 647A3 Dover, New Jersey.

MAKE Money operating home mailorder business. No inventory. Write Purple Enterprises, Box 16291-AW, Jacksonville, Fla. 32216.

PLASTERCRAFT Molds. Liquid rubber, plasters, flocks, candle supplies. Catalog and manual free. Blue Rapids Supply, Blue Rapids, Kansas.

FREE Report: "509 Unusual, Successful Businesses!" Box 51-PO, Des Plaines, Illinois 60017.

"SECRETS Of Finance Capital." Tested sources of loans, capital, grants. Write: National Counselor, Harlingen 17, Texas.

MEDICARE-Social Security. Earn top fees assisting clients obtain maximum benefits. Accredited. National Tax Training School. Monsey, R302, New York 10952.

"MAILORDER" No Investment in products! Free gift catalog. Methods, 1819-FD, Lafayette Hill, Pennsylvania 19444.

EARTHWORM Growers needed! Good-paying home business! You raise, we buy! Free picture folder! Cal-Bait, 8616 Fair Oaks Boulevard, Carmichael, California 95608.

FREE! Catalogs, offers. EWS Enterprises, P.O. Box 403, Chatsworth, Calif.

FREE Report. "Home Business Opportunities." Immediate earnings! Wyman, H-113, Congers, New York 10920.

EXTRA Income with mailorder drop shipment. Free details. Merwood, Dept. P69, Box 3987, Anaheim, Calif.

ECUADOR Gold Expedition now forming. Share profits. Lee Baker, 2606 Newhall, Santa Clara, California.

BIG Profits mailing catalogs. Postcards. Matteson, 1341 Stonylane, No. Kingstown, Rhode Island 02852.

\$1000.00 MONTHLY Collecting delinquent accounts by mail. Continental Associates, 1004 Grand, Des Moines, Iowa 50309.

NEED Money at home! Five unusual businesses on "shoestring"! All 5 confidential reports, only \$2.98. Money-back guarantee! International, (PM), Box 7798 Atlanta 9, Georgia.

DIFFERENT! Outstanding profits from high quality mailorder businesses. Complete setup service; not just instructions. Hermes Co., 152 West 42, New York City 10036.

IMPORT-Export business made easy. Complete setup service. Not just instructions. Hermes, 152 West 42, New York City, 10036.

AUSTRALIA'S "World-Directory" listing: \$1.00. State interests. Thompson, 2 Shaw, Doubleview, Western Australia.

AMAZING Mailorder profits using proven methods. Particulars free. Unicus, Box 735-PL, Norwalk, Conn. 06852.

VACUUM Plastic molding & liquid plastic casting—At home! Make hundreds of full 3-D plastic products. Big profit in spare time. Free facts, samples. Nationwide Plastics, Dept. VC, 12305 Hawthorne Blvd., Hawthorne, Calif. 90250.

INVESTMENT And profit returned on initial order. Custom plastic sign forming kit complete. All sales materials and supplies. Supply reorder profits \$2,000.00. Cash or terms. Cash saves \$150.00. Sample sign \$2.00. Signs, Box 2988, Asheville, N.C. 28802.

FOUR Words to a fortune. Pour your own floor. Dur-A-Flex seamless floor kit enables anyone to apply their own floors, walls, counters or patios. Tough, resilient, self-leveling urethane that requires no waxing. Write for details or send \$10.00 for a trial order. Dur-A-Flex, Inc., Dept. M, 269 Franklin Ave., Hartford, Conn.

NEW! Six months on the job training. Import-Mailorder program for \$10. Free report! Donkar, 1914A LaCana, Hacienda Heights, Calif. 91745.

LEARN Speedometer repair. Make good money. Instrument School, Box 5319, Tulsa 4, Okla.

EARN \$1.50 To \$4.50 hourly in spare time. Equipment, training, unnecessary! Your success guaranteed. Send \$1.00. G.P.I., Box 629, Asheville, North Carolina.

EARN Extra money selling advertising book matches. Sample kit furnished. Lion Matchcorp, Dept. PM-96C, Chicago, Illinois 60623.

EARN Money raising fishworms for us! Write: Oakhaven-38, Cedar Hill, Texas.

PROFIT With Popular Mechanics' subscription plan. No investment, no experience needed. Earnings begin immediately when you obtain subscription for Popular Mechanics, Good Housekeeping and others. High commissions, bonus. No experience needed. Deal directly with the publisher. Write Popular Mechanics, Room 9B, 250 West 55th St., New York 19, N.Y.

MONEYMAKING OPPORTUNITIES

\$200.00 FROM Sheet 1/4" plywood (scrap). 25¢ refundable. Novelties, 610 So. 24th, Elwood, Indiana.

MINK Raising information free. Lake Superior Mink Farm Inc., Superior, EE1, Wisconsin.

EARN Big commissions full or part time. Show America's largest line low priced business printing and advertising specialties plus big catalog union label political advertising items. Calendars in season. Big free sales kit samples hundreds items used daily by businessmen and political candidates. Merchandise bonuses for you. Free gifts for customers. Build profitable repeat business. Start now. National Press, Dept. 147, North Chicago, Ill.

EARN \$240.00 a month at home, spare time, doing only two \$5.00 invisible mending jobs a day. Big money paid for service that makes cuts, tears disappear from fabrics. Steady demand. Details free. Fabricon, 1522 Howard, Chicago, Ill. 60626.

CLIP Newspaper items. \$1.00-\$5.00 each. Details free. Walter, Box 1360-P, Erie, Pa.

BIG Money raising fishworms and crickets. Free literature. Carter Hatchery, Plains, Georgia.

NEW Instant invisible mending. Learn in one hour, repair in five minutes. Make \$150.00 week. Literature free. Henson, P.O. Box 6136-6, Philadelphia, Pa. 19115.

SHARP \$\$\$ Opportunity! One low-cost machine sharpens—serrates knives, scissors, pinking shears. Earn \$6-\$9 hourly in spare time. Professional results without experience. Free details. Beaver Machine, 936C Nielson Bldg., Eugene, Oregon.

\$400.00 MONTH Possible raising night-crawlers, redworms. Three Oaks Ranch, Dresden, Tenn.

AMAZING Successes through franchises! Become exclusive franchise holder your territory. Information rushed. National Franchise Reports, WP-528, 333 North Michigan, Chicago 60601.

RAISE Rabbits and fishworms on \$500 month plan. Free details. White's Rabbits, Mt. Vernon, Ohio.

MAKE Big money taking orders for Stark Dwarf fruit trees. Everybody can now grow Giant Size Apples, Peaches, Pears in their yards. Also Shade Trees, Shrubs, Vines, Roses, etc. Outfit free. Stark Bro's, Desk 30197, Louisiana, Missouri 63353.

EARN Extra money spare time \$5 per hour—vacuum cleaner repair—information, \$1.00. P.O. Box X922, Poughkeepsie, N.Y. 12602.

MONEYMAKING Opportunities in closed-circuit TV. Full or part time. Send 10¢ for details. ATV Research, Box 396-PMM, South Sioux City, Nebraska 68776.

LEARN The secrets of repairing junk batteries. "Fabulous Profits" at home. Details. The Batteryman, P.O. Box 477, San Marcos, Calif.

MAKE Money writing short paragraphs! No tedious study! I tell you what to write, where and how to sell, and supply list of editors buying from beginners. Many small checks add up quickly. Write to sell, right away. Send for free facts. Benson Barrett, Dept. C-27-H1, 6216 No. Clark, Chicago 26.

VENDING Machines. No selling. Operate a route of coin machines and earn amazing profits. 32-page catalogue free. Parkway Machine Corporation, 715 PMM Ensor Street, Baltimore 2, Maryland.

WATCH Repairing. Swiss and American watches. Develop skill step by step in spare time at home. Tuition only \$5 monthly. Diploma awarded. Free sample lesson. Chicago School, Dept. YJA, Fox River Grove, Illinois 60021.

\$25.00-\$75.00 WEEKLY Possible. Addressing envelopes. Compiling names. (Longhand-typewriter). Details free. Superior, Box 721-A, Elkton, Maryland 21921.

HANDYMEN! Make up to \$10 hourly installing device needed by every house, apartment. Free details. Kennedy Co., Box 130A, Ayer, Massachusetts 01432.

MAKE Big easy profits making costume jewelry at home, spare time! Quick, easy to make; easier to sell! Details Free! Don-Bar, 2934 Fullerton, Dept. K-206, Chicago Ill. 60647.

OPERATE Restaurant or diner. Free booklet reveals profitable plan. Write Restaurant Business School, Dept. EC-99, 1920 Sunnyside, Chicago, Illinois 60640.

MAKE \$100.00 Fast, assembling belts for profit. Redikut's, Loganville 40, Wisconsin.

INVESTIGATE Accidents for insurance and transportation companies. Work from home in spare time. No previous experience or college education necessary. Some men make up to \$8 an hour, plus expenses. We train you at home by mail through easy 15 minutes a day program. For free information write Liberty School, Dept. A59, 162 East Cook, Libertyville, Illinois 60048.

SPARE Time cash. Sell famous Hanover shoes. Actual samples and sales kit free. No experience needed. No age limit. Lowest prices for high quality makes selling easy. Every man a prospect. Big daily commissions. For full details, write Hanover Shoe, 258 Carlisle, Hanover, Penna.

BEGINNERS' Best mailorder business "Money Getter!"—Particulars free! Fisher Systems, B-128, Lime Springs, Iowa 52155.

YOU Can operate profitable home mail-order business. Write, Distributors, Dept. PM, Box 306, Leominster, Mass. 01453.

NEW Mailorder course. 24 easy lessons. \$2.00. Global, P9M, 9107 Joy, Oak Ridge, Tenn. 37830.

TELEPHONE And mail sell dollar ads. I show you how. \$5. hour plan. Free details. Ad Market, Harlingen 4, Texas.

\$10 DAILY Writing short articles at home. Begin immediately. Copyrighted report reveals how and where. Send \$1.00. Hyatt Sales Company, 700 Conway Street, St. Paul, Minnesota 55106.

WE'LL Help you plan—mail order business—part or full time. Free details. Ad-Creators, Hutchinson, Kansas 67501.

SELL By mail, easy, profitable. Information free. Dutz, Box-284-A, Lincoln, Illinois 62656.

\$10, DAILY Writing short articles at home! Begin immediately! Send \$1.00. PanAm, (PM), Box 11796, Atlanta 5, Georgia.

MONEY And mail order success begins with your own original product. Unleash your creative ability and develop your own, unusual, sold only by you, product. New easy, important, secret methods. Send for details now. Readis Books, Dept. PPM, 303 West 42nd St., New York, N.Y. 10036.

EARN Money evenings, copying and duplicating comic cartoons for advertisers. Adservice, Argyle-1, Wisconsin.

PROFITABLE OCCUPATIONS

INVESTIGATE Accidents. Earn \$750 to \$1,400 monthly. Car furnished. Expenses paid. No selling. No college education necessary. Pick own job location. Investigate full time. Or earn \$9.44 hour spare time. Men urgently needed now. Write for Free literature. No obligation. Universal, CPM-9, 6801 Hillcrest, Dallas, Texas 75205.

VENDING Machines. No selling. Operate a route of coin machines and earn amazing profits. 32-page catalogue free. Parkway Machine Corporation, 715 PMM Ensor Street, Baltimore 2, Maryland.

SHARPEN Scissors, pinkers. Inexpensive equipment, tools, supplies. Blackhawk's, Sheldahl, Iowa.

FREE Facts and descriptive bulletin. Be an air conditioning, refrigeration, and heating serviceman. High pay, jobs open everywhere, operate your own service business, no school or correspondence necessary. Write Doolco. Trouble Shooter, 2016 Canton, Dallas, Texas.

BECOME Independent with your own franchise business. Thousands earning handsome incomes. Request interesting facts today. National Franchise Reports. PM-528, 333 North Michigan, Chicago 1

CHROME Plating. Instructions, equipment and supplies. Platers' Supply, P.O. Box 565, Lugo Station, Los Angeles, Calif.

FREE Book "990 Successful, Little-Known Businesses." Work home! Plymouth-97J, Brooklyn, New York 11218.

YOUR Own sign shop—Signs, 1017 W. Mulberry, Springfield, Ohio.

FREE Catalogs. Repair air conditioning refrigeration. Tools, supplies, full instructions. Doolco, 2016 Canton, Dallas, Texas 75201.

SCIENTIFIC Massage: Big earnings, uncrowded profession. Learn spare time at home. Diploma awarded. Free catalog. Write: Anderson School, Dept. J-1C Princeton, Illinois.

AUCTIONEERING—Resident & home study courses. Veteran approved. Auction School, Ft. Smith, Arkansas.

RAISE Rabbits for us on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

MAKE Money writing short paragraphs. Information free. Barrett, Dept. C-27-H2, 6216 N. Clark, Chicago 26.

REPAIR Power tools, jacks, pullers. Diagrammed instruction manuals. Samples. Tech-Aids, Box 381, Baton Rouge, Louisiana.

BIG Money raising fishworms and crickets. Free literature. Carter Wormery, Plains, Georgia.

BECOME A mortgage broker, earn \$10,000 to \$50,000 a year. Details free. United, Box 6284-C, Marietta, Georgia 30060.

BAKE New greaseless doughnuts in kitchen. Sell Stores. Free recipes. Michael Ray, Waseca, Minnesota 56093.

AMAZING Profits in worms. Free information. Hillaire Farms, Northville, Mich.

EARN \$240.00 A month at home, spare time, doing only two \$5.00 invisible mending jobs a day. Big money paid for service that makes cuts, tears disappear from fabrics. Steady demand. Details free. Fabricon, 1586 Howard, Chicago, Ill. 60626.

SALESMEN—DISTRIBUTORS

SENSATIONAL New longer-burning light bulb. Amazing free replacement guarantee—never again buy light bulbs. No competition. Multi-million dollar market yours alone. Make small fortune even spare time. Incredibly quick sales. Free sales kit. Merlite (Bulb Div.), 114 E. 32nd, Dept. C-73C, New York 16.

EARN Big commissions full or part time. Show America's largest line low priced business printing and advertising specialties plus big catalog union label political advertising items. Calendars in season. Big free sales kit samples hundreds items used daily by businessmen and political candidates. Merchandise bonuses for you. Free gifts for customers. Build profitable repeat business. Start now. National Press, Dept. 146, North Chicago, Ill.

JOIN An established firm. Over 30 years with Calendars and advertising specialties. Bonuses—prizes—free pens. Fleming, 6535-A Cottage Grove, Chicago 60637.

FREE. 206 Easy ways to make money taking orders for exciting new products—spare time. Send name, age for 5 months free subscription Opportunity Magazine. 850 N. Dearborn, Dept. 17-G8, Chicago.

SELL Advertising book matches. Write us today, we put you in business by return mail; handling complete line ad book matches in demand by every business right in your town! No investment; everything furnished free! Top commissions daily. Superior Match, Dept. M-966, 7530 S. Greenwood, Chicago 19, Illinois.

LONG Needed invention. Man to contact service stations. Huge profits. Cyclo Mfg. 3816 Dahlia, Dept. 177, Denver, Colo.

\$5.95/HOUR Demonstrating inexpensive checkwriters. Everybody wants! Jim Rasmussen, Box 25252, Los Angeles, California 90025.

ANYONE Can sell Hoover Uniforms. Full or spare time. Unlimited money-making opportunities. Immediate top commissions. Big market. No investment. Send for free sales kit. Hoover, Desk K-98, New Hyde Park, N.Y. 11040.

MAKE More extra cash! World's biggest line Christmas, everyday greeting card assortments, gifts. Show friends, neighbors over 150 assortments. 500 big money-makers. Up to 100% profit plus cash bonus. Free giant color catalog; samples on approval. Arrow Greetings, 513 Fourth Ave., S., Dept. 39X9, Minneapolis, Minn.

MAKE \$50.00 Daily selling top quality car polish. Free details. Inka, 2401 Crocker, Houston, Texas 77006.

\$1,000.00 a month for making dramatic 3-second demonstration of amazing lightweight Presto Fire Extinguisher. New chemical used by Airforce snuffs out fires instantly. Only \$4.95. Terrific commissions. Millions want it. Free Kit. Merlite, 114 E. 32nd, Dept. P-66C, New York 16.

AGENTS WANTED

YOUR Own business—Used suits \$1.50; overcoats 65¢; mackinaws 35¢; shoes 12½¢; ladies coats 30¢; dresses 15¢. Enormous profits. Catalog free. Nathan Portnoy Associates, 2109-AA Roosevelt Road, Chicago 8, Ill.

CHRISTMAS Cards—business and personal. Customer's name imprinted. Earn unusually high commissions from this medium—and high-priced line. Free sample album. Process Corp. (our 45th year), 3458-C S. 54th Ave., Chicago, Ill. 60650.

MAKE Extra money—show friends, neighbors—gifts, stationery, Christmas, all occasion cards. Experience unnecessary. Salable samples on approval, free catalog, free name imprinted Christmas card album. Hedenkamp, 361 Broadway, Dept. PM-90 New York.

ESTABLISH Your own business. Low prices on used clothing, shoes, household goods. Unlimited profits. Free catalog. Northwestern Distributors, 2129 No. Western Avenue, Chicago, Illinois 60647.

MAKE Extra money introducing new runless seamless nylons at amazing low direct-from-mill price, 59¢ a pair! Friends snap them up by the dozen. Write for free sample stocking and kit. American Hosiery Mills, Dept. 130, Memphis, Tennessee 38101.

MAKE \$50.00 Daily selling air operated vacuum cleaners to service stations. Free details. Inka Industries, 2401 Crocker, Houston, Texas 77006.

GET New shirt outfit free! \$90 weekly on 5 average orders a day. Famous quality made-to-measure dress and sport shirts at \$4.95 up, sell to all men. No experience needed. Full or part time. Write: Packard Shirt Co., Dept. 509, Terre Haute, Indiana 47808.

START Making money now. Earn top commissions taking orders for all magazine subscriptions. Friends and neighbors are your prospects. No experience needed. Write for free money-making kit. McGregor Magazine Agency, Dept. OAT, Mount Morris, Illinois 61054.

250,000 NEW Mothers every month! Bonanza for bronzed baby shoes! \$50.00 a day profit. No investment, no inventory. Full or spare time. Exciting details free. Sentimental, 1919 Memory Lane, Dept. 8J, Columbus, Ohio 43208.

RAISE Rabbits for us on \$500 month plan. Free details. White's Rabbitry, Mt. Vernon, Ohio.

MAKE Up to \$100 a week spare time. Get free shoes too, as Mason shoe counselor in your neighborhood. No investment. Everything needed sent free. Rush name and address on Mason Shoes, Dept. K-556, Chippewa Falls, Wisconsin 54729. No obligation.

AMAZING Christmas card profits! Make 75¢ on \$1.25 assortment; \$75.00 on 100. Plus bonuses. 257 new, easy spare time money-makers. Free personalized album. Smart hand-appliqued mad hatter notes free with approval samples. Creative, 4401 Cermak, Dept. 510-P, Chicago 60623.

FREE Copy! "How to Cash in on baby boom"! Discloses how men, women can make to \$7.00 hourly in spare time representing local merchants. Write: FRP-B, 2615 Olympic, Los Angeles 90006.

LEARN Mailorder, stamped addressed envelope. Talbert, 216 Landon, Buffalo, New York 14208.

WILL You test new items in your home? Surprisingly big pay. Latest convenience for home, car. Send no money. Just your name. Kristee, 148, Akron, Ohio.

INSTANT Profits! 40% advance commission taking orders for sensational new plastic photo enlargements, personalized photo-rings, compacts, bracelets. Sales kit free. Novelco, 3343 North Avenue, Chicago 60647.

TEAR Out this ad and mail with name, address for big box of home needs and cosmetics for Free Trial, to test in your home. Tell your friends, make money. Rush name. Blair, Dept. 31CT, Lynchburg, Va. 24505.

PRINTING. Advertising salesmen—Excellent moneymaking sideline selling decalcomania name plates, small quantities. Automobile initials, sign letters. Free samples. Balco, XL, Boston, Mass. 02119.

EMPLOYMENT INFORMATION

BOOMING Australia needs your skills! Government assisted passage. Details. \$1.00. Irv Heyer, 321A S.W. Salmon, Portland, Oregon.

DIRECTORY Reports. Construction, aviation, shipping, oilfields, government, manufacturing, trucking, etc. foreign—stateside. Helpful information plus job-getting tips on preparing application letters. Unconditional money-back guarantee. Only \$3.00 (\$3.25 airmail) Research Services, Box 6768-PM, St. Louis, Missouri 63144.

TREMENDOUS Opportunities U.S.A.—Overseas. Choose jobs—locations—transportation. Free details. Occupations, International Airport, Box 100-C6, Jamaica 30, N.Y.

CAPE Kennedy area. Availabilities stateside and overseas. Companies to contact. Report \$2.00 InterOcean, Dept. M9, Box 1883, Cocoa, Florida 32922.

INVEST \$2.00 For a future in Auto Mechanics if you like working on cars, trucks, motors, tractors. Learn what you can earn working for yourself, others. How to be your own boss. Operate your own shop. All these and other important questions scientifically compiled are answered for you in "Auto Mechanics Career Opportunities Manual." Thousands of mechanics needed everywhere. Cash in now. Send only \$2.00 for valuable information that can be worth thousands to you, and we will include a "Self-evaluation Kit" to aid in determining your aptitude based on personal qualifications. Vocational Information Service, Dept. PM1, 537 S. Dearborn St., Chicago, Illinois 60605.

CURRENT Openings, worldwide, hundreds listed, report \$4.50, sample back issue \$1.00. International Research Ltd., 103 Park Avenue, New York N.Y. 10017.

JOBS. Passenger ships, freighters, \$100 weekly, beginners, men, women, for information enclose \$1.00. Box 52, N.Y.C. 10016.

FOREIGN And USA job opportunities available now. Construction, all trades. Earnings to \$2,000.00 MONTHLY. Paid overtime, travel bonuses. Write: Universal Employment, Dept. C-1, Woodbridge, Connecticut 06525.

HELP WANTED

OVERSEAS Jobs—Europe, South America, Far East, etc. 2,000 openings in all trades. Construction, Office Work, Sales, Engineers, etc. \$400 to \$2,500 month. Expenses paid. Free information, write Overseas Jobs, Box 22456M, Fort Lauderdale, Florida.

FARMS—REAL ESTATE

CANADIAN Lands, seized and sold for taxes. Our 49th annual series of lists, describe many choice properties, situated from coast to coast, acquired by us through tax sale. Priced as low as five dollars per acre, guaranteed perfect title, small monthly payments, no mortgage. Beautifully situated hunting and fishing camps, where there is real sport: summer cottage sites, heavily wooded acreages. Now is the time to invest in Canada's minerals, forests and farms. Write today for free twenty page booklet with full explanation. Tax Sale Service, Room 301-D, 85 Bloor St., E., Toronto 5, Canada.

400,000,000 ACRES Government public land in 25 states. Some low as \$1.00 acre, 1966 report. Details \$1.00. Public Land, 422-PM-9, Washington Building, Washington, D.C.

FREE Summer catalog! Bargains galore! Coast-to-coast! Low prices, easy down payments! Safe-Buy Real Estate Agency, 712-PM, West Third, Little Rock, Ark. (Please include Zip Code.)

GOVERNMENT Lands . . . Low as \$1.00 acre! Millions acres throughout U.S. Free details! Lang Digest, Box 260-34-PI, Indianapolis, Ind. 46226.

ABANDONED Timber Leaselands! Choice 640 acre Sportsmen's paradises still available—\$20.00 plus \$6.50 Taxes yearly. Maps, pictures, \$1.00 (Refundable). Director, Erindale 4, Ontario, Canada.

NORTH Florida lots, \$69.00 each, Casper Corporation, 3970 N.W. 177 St., Miami, Florida 33054.

FREE—Public land bulletin, listing millions of acres . . . with copyrighted booklet "How to Acquire Public Lands." Send \$1.00. Land Service, P.O. Box PM4496, Washington, D.C. 20017.

CANADA'S Finest lands, \$4.00 an acre and up. Acquired through estate liquidations. Suitable for hunting, fishing, camps, cottages, farming, timber, minerals, investment. Small monthly payments. Free descriptive booklet. Canadian Estate Land, 2788-P Bathurst Street, Toronto, Canada.

\$1 ACRE—Canadian border—hundreds campsites, islands, farmlands, directly from tax authorities. (Non-profit). Lists, photographs mailed. Register, Room 303, 92 King St. E., Toronto 1, Canada.

FREE Fall catalog! Big new 180 pages! Selected best thruout the U.S. Thousands of properties described, pictured—land, farms, homes, businesses—waterfront, recreation, retirement, 66 years' service, 490 offices, 36 states coast to coast. Mailed free from the world's largest! Strout Realty, 60-RX E. 42nd St., N.Y., N.Y. 10017. 7-RX S. Dearborn St., Chicago, Ill. 60603. 521-RX E. Green St., Pasadena, Calif. 91101.

FREE!!! 168-Page real estate catalog! New fall-winter issue! Over 1800 pictures! Farms, ranches, homes, businesses, vacation and retirement properties in 29 states coast to coast! United Farm Agency, 612-PM West 47th St., Kansas City, Mo. 64112.

BUY Without risk for retirement, vacation, or investment—under America's only "no-risk purchase plan" in Carolina Coast multi-million dollar, 14,000-acre development, 10 year money-back guarantee. Payments less than \$5.00 monthly. Shopping center, motel, hunting, fishing, golf, country club, right on property. Private ocean beach. Write for free literature. (Not offered to residents of California, Florida, New York.) Boiling Spring Lakes, Southport 1-Y, North Carolina 28461.

FLORIDA Campsites—deep in the heart of the great Ocala National Forest. Good hunting and fishing. Free maps and photos. Howard Vernon, DeLand, Florida, AD646369D

CALIFORNIA Acreage. From \$10. Down, \$10. Monthly. Box 35291, Los Angeles 90035.

PAY \$10.00 Down. Make \$50.00 or more weekly. Full explanation. Robert Mariette, Roosevelt Rd. & Parkside 18, Glen Ellyn, Ill.

CANADIAN Vacation lands: Full price \$385.00, 40 acres, \$10 month. Suitable cottage sites, hunting, fishing, investment. Free information. Land Corporation, 3768-C Bathurst, Downsview, Ontario, Canada.

FARM AND GARDEN EQUIPMENT

DRILL Your own water well for 2¢ per foot! New high-speed drilling rig only \$145 complete. Brochure and "How to Find Water on Your Property" 25¢. DeepRock Drilling Company, 605 Trafco, Opelika, Alabama 36801.



FLOWERS, PLANTS and NURSERY SUPPLIES

GINSENG Goldenseal wanted. Write for free price list and tags. Buying direct fifty years. Consolidated Raw Fur & Ginseng Co., Dept. PM, 157 West 29 Street, New York 10001.

GINSENG Bringing \$14 pound. Have seeds, plants, Goldenseal. Full information. K. Collins, Viola, Iowa 52350.

WANT Greatest cash crop working for you? Write Ginseng, Asheville 53, N. C.

HOME CRAFTSMEN

WALNUT And cherry tapered legs, lumber, gunstock, blanks, picture frame moulding. Midland Lumber Company, Box 262, Savannah, Missouri.

FREE! Big 50 page Leathercraft catalog, 100's of new items! MacPherson Bros., Dept. K, 730 Mission St., San Francisco, Calif. 94103.

PICTURE Frame moulding—Any size, style, wood. Original patterns. Write, Japs, 126-P Seventh North, Hopkins, Minn. 55343

SKIL-Crafts new '65-'66 Catalog. Largest and finest selections of leathercraft, artist, hobby-craft supplies in the world. Send 50¢ (refunded plus free gift with first \$5 minimum catalog order). Skil-Crafts, Box 105-P, Joplin, Missouri.

WOODWORKING Catalog and manual 25¢. Plus free "101 Project Ideas." World's most beautiful veneers, lumber, plywood! Wood finishing, upholstery supplies. Furniture hardware, 2,000 needed workshop products. Constantine, 2051-N Eastchester Road, Bronx 10461.

KNOCKDOWN Cedar chests, also over fifty kits. Catalog 25¢. Giles Kendall Co., Huntsville 2, Alabama.

BURGLAR Alarm. Open door—horn sounds. Battery operated. Plans, \$1.00. Finished unit—\$4.85. Mass. residents add 3% tax. Minute Man House, Box 445, Lexington, Mass. 02173.

2512 PLANS. Patterns, things to make, do. Fun. Profit. World's greatest selection, Catalog 10¢. Craftplans, 18250-A Harwood, Homewood, Ill.

CABINETMAKING Made easy and "How to Make Formica Counter Tops," two excellent guides let you build kitchen cabinets and counter tops like professionals. Extraordinary guides bring master craftsmen's shortcut methods. Satisfaction guaranteed. Write: Japs, 126-P Seventh North, Hopkins, Minn. 55343.

CROSSBOW Kit: 50 pound recurved bow, trigger assembly, hardware, detailed plans, \$10 postpaid check, money order. Falcon Crossbows, 130 Fieldstone, Johnstown, Penna. 15904.

CROSSBOW: New exciting toy. Easily made child's crossbow. Instructions, detailed plans \$1.00 postpaid. Falcon Crossbows, 103 Fieldstone, Johnstown, Penna. 15904.

WOODWORKER—Home craftsman catalog containing clock kits, lamp parts, chair-cane, veneers, swiss musical movements, legs, furniture, hardware, mouldings, finishing materials, tools, etc., only 15¢. Barap Specialties, Box 2044-EG, Chicago 60609.

101 PATTERNS Of smart gifts, novelties, shelves, action windmills plus "Make Money Jig Sawing" \$1.00. Mastercraft, 95M, 7041 Olcott, Chicago 60631.

PLANS for pool table with extra two-face top for table tennis and model railroad. Blueprints B1209 and building instructions \$3.50. Popular Mechanics Service Bureau, 575-M Lexington Ave., New York, N.Y. 10022.

DO-IT-YOURSELF

AUTOMATIC Washer repair manuals for: Frigidaire, General Electric, Hamilton, Hotpoint, Kelvinator, Kenmore, Norge, RCA Whirlpool, Speed Queen, Westinghouse, Maytag, Philco-Bendix, \$2.50 ea. PPD. Major Appliance, 13106 Caine Ave. (Dept. M) Cleveland 5, Ohio.

MOVE Tons with one finger on simple device: powered by vacuum cleaner. Plans, specifications, \$1.50. J. C. Engineering Co., Box 5093, Middle River, Md. 21220.

BUILD Concrete block machine. Easy, inexpensive. Motor or hand operated. Make block per minute. Write: Clyde Lee, Mountain View, PM, Oklahoma.

WATER Free. Sink your own well. Easy illustrated instructions, \$1.00. Butler, Box 67, East Longmeadow, Mass.

EXERCISE At home on build-it-yourself physical fitness equipment, including bicycle exerciser, rowing machine, belt massager, and abdominal board. Send \$2.50 for blueprints B1208 and instructions, Popular Mechanics Service Bureau, 575-K Lexington Ave., New York, N.Y. 10022.

FREE Check-list covering more than 300 classifications of projects, plans, instructions, service and repair information detailed in Popular Mechanics famous series of instructional booklets, books, patterns, and blueprints. List covers an extremely wide variety of do-it-yourself data on home remodeling, repair and improvement, hobbies, crafts, boating, games, lawn and garden, and hundreds of others. For your free copy of this helpful list, write: Service Bureau, Popular Mechanics, 575 Lexington Ave., New York 22, New York.

ARTS AND CRAFTS

STAINED Glass, plastics, jewelry, copper enameling, mosaics, metalcraft. Cat 50¢. Bergen, Box 689M, Salem, Mass.

MAKE Figurines, plaques, lawn ornaments, molds, plastercraft kits, liquid rubber. Sample and catalogue 10¢. Woolley Company, Box 29-B, Peoria, Illinois.

BINOCULARS, TELESCOPES, MICROSCOPES, MAGNIFIERS

BINOCULAR—Riflescope sale! Free color catalog, 100 models, \$9.95-\$250.00. Write: United, 9043 So. Western BCAT-6508, Chicago 60620.

REFLECTOR And refractor telescopes, kits, tripods, etc. Free catalog. Suffolk Science, Mattituck, New York.

BUILD Your own reflector telescopes. Complete kits: mirrors, eyepieces, tripods. All other accessories. Request free illustrated literature. Criterion Manufacturing, Dept. KPM 42, Hartford, Connecticut.

DYNASCOPE—Amazing world-famous reflector telescope. Request free brochure. Criterion, Dept. DP 28, Hartford, Connecticut.

SCIENCE Bargains! Lenses, telescopes, binoculars, microscopes, kits, parts, war surplus. Send \$1.50 for beginner's 10-lens kit with instruction booklet. Order Stock 2-CH. Request free 148 page Catalog CH. Edmund Scientific Co., Barrington, New Jersey.



CAMERAS AND EQUIPMENT

TELL The more than 1,400,000 avid readers of Popular Mechanics about your products and services. It costs very little to place your classified message in front of these proven mail order buyers. For further details, write: C. A. Martin, Dept. 49N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

PHOTO SUPPLIES

YOUR Ad in this space will be read by more than 1,400,000 active mail order buyers. Join the march to greater profits, place your products and services in front of them today with a small low cost classified ad. For further details, write: C. A. Martin, Dept. 15N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

PHOTO FINISHING

CAMERA Fans! Expert photofinishing and free film returned: 8MM Kodachrome \$3.10; 8 Exp Kodacolor \$3.10; 35MM Kodachrome, 20 slides, \$2.85; 8 exp black & white 90¢. We give you free photo stamps to redeem for gifts. Satisfaction guaranteed. Send exposed film or request mailers and complete price list. Direct Mail Photo, Box 8352-PM, Pittsburgh, Pa. 15218.

A FREE Kodak roll returned with each black and white or Kodacolor developed and printed, fast service, lowest prices, guaranteed quality send for free mailers. Economy Photo Service, Dept. P. M., Box 1111, Albany 1, N.Y.

FAST, HI-quality finishing. Kodacolor rolls: eight jumbo prints \$1.98. Twelve \$2.49. Twenty \$3.49. Reprints 15¢. Also low B&W prices. Custom Quality Studio, Box 4838-PM, Chicago 60680.

FREE Roll of film for each roll developed, black & color film developed for \$1.00. Henry Turner, 520 Cleveland Ave., Schenectady, N.Y. 12306.

KODACOLOR: 8 Exposures, \$2.00. 12 Exposures, \$2.50. Black and White: 8 Exposures, .50¢. 12 Exposures, .70¢. Our 50th year. Free mailers. Savon Photo Service, Box 110M, Watertown, Wisconsin.

COLOR SLIDES

TRANSPARENCIES Wanted! Learn free-lancing. American Color, Box 46372, Hollywood, California.

MOTION PICTURES AND SOUND EQUIPMENT

16MM sound-projectors, films, new, used for sale. Free catalog. National Cinema, 333 W. 57 Street, New York City, N.Y. 10019.

5,000 8-16 MM. Movie films. Free catalogues. International, Greenvale, N.Y.

16MM Sound films features and shorts. Bedner, 5300 So. Talman, Chicago.

8MM MOVIES. 2"x2" Color slides—biggest selection anywhere! Hollywood classics, railroad, antique automobiles, circus, World War II, travel, wildlife, many others. 16mm films also. Big catalog free. Blackhawk Films, 24 Eastin-Phelan Bldg., Davenport, Iowa 52808.

FREE Literature cartoons, comedy's glamour, travel. Bernard, Box 854, Chicago 60642.

8MM Movies—Classics, horror, travel, animals, WW 1, 2 x 2 Color Slides—Civil War, WW I. Free catalog. Entertainment Films, 850 7th Ave., NYC.

FREE Catalog! Save on 8/mm.-16mm. film and supplies. Superior, 448 N. Wells, Chicago 10.

RADIO, TELEVISION AND HAM EQUIPMENT

CONVERTERS For automobile radios, receive Marine, Police, Fire, 2-3, 30-50, 100-200 megacycles. Any kit \$5.00. Meshna, Lynn, Mass. 01904.

TV Camera kits, \$18.95 up. Catalog 10¢. ATV Research, Box 396-PM, South Sioux City, Nebraska 68776.

BRAND New tubes. World's lowest prices on radio, TV-industrial, special purpose tubes. Write for free parts catalog. United Radio, Newark, N.J.

33¢ RADIO & TV tubes. Free list. Cornell, 4213-17 University, San Diego 5, California.

BECOME A radio announcer. . . . de-jay complete manual only \$3.00. Details free. AIRA-P, 1705 West Cone, Greensboro, N.C.

FREE 1967 Allied catalog. Buy from world's largest electronics headquarters, save most on: famous Knight-kits, stereo hi-fi, tape recorders, CB gear, FM-AM, AM, shortwave radios, portable TV, phonographs, amateur gear intercoms, P.A., automotive electronics, test instruments, TV antennas, tubes, power tools, parts, books. No money down. 24 months to pay. Write Allied Radio, Dept. 6-JC, P.O. Box 4396, Chicago, Illinois 60680.

WORLD'S Tiniest radios. Recorders, transceivers, portables. Free catalog. Minitrans, 1983-9613 Via Del Rio, Corona, California 91720.

BEGINNER Kits, crystal radio, \$1.95; solar powered radio, \$4.95; wireless transmitter, \$3.95. Electronix, Box 1067, Southgate, Michigan 48195.

FREE Electronics catalog. Tremendous bargains. Send postcard. Electrolabs, Department C650B, Hewlett, New York 11557.

HIFI, RECORDS AND ELECTRONICS

RECORDS! Discounts on all LP's. Free details. Citadel Record Club, 545 Fifth Ave., Dept. 2, New York 17, N.Y.

TAPE Recorders, hi-fi components. Sleep learning equipment, tapes. Unusual values. Free catalog. Dressner, 1523 Jericho Tpke., New Hyde Park 3, N.Y.

LOW Quotes, fast service, everything in Audio. Dynaco our Specialty—kits or wired and handcrafted walnut Dyna Covers. Kitecraft, 738M Washington Avenue, Brooklyn 11238.

25 LP's Albums free! Name the Nation's ten top tunes! Free details. Hollywood Recopa, 518½ South Broadway, Baltimore, Md. 21231.

PLANS For stereo cabinets. Early American, Mediterranean, Contemporary, \$2.00 each. M&W, P.O. Box 2186, Renton, Washington 98055.

EXCLUSIVE Free catalogue; extraordinary hard to find hobby party records. Record Suppliers, 300 Chelsea, Louisville, Kentucky 40207.



MUSIC AND MUSICAL INSTRUMENTS

GUITAR. Banjo Making books. Plans, woods, necks, tools. List 20¢. Sartinwood, 510 East 11th Street, New York 9, N.Y.

SONG Ideas wanted. Write with active professional songwriters with publisher contacts. Records made. Share royalties. Send ideas—free examination. Songwriters' Associates, 236 W. 55th, N.Y. 19-P.

PIANO Self-Teaching Book. Includes popular, classical, harmony, theory, chords, scales. Price \$5.00. LaPont Publishing Company, Box 606-P, Franklin, Michigan 48023.

SONGPOEMS Wanted. Send poems for offer. Nashville Music Institute, Box 532-PM, Nashville, Tennessee.

SONGS Wanted by new commercial recording company. Royalty basis. Send material to Preview Records, 8311-B Yucca, Hollywood, California 90028.

GUITARS. \$11.95. Electric double pickups with tremolo bar, \$49.95. Accordions, \$125.00. Concertinas, \$350.00. Drums pearl set, \$99.00. Wind instruments \$38.95. Free catalogs. EZ, Terms. Melody Music, 4951 W. 95th St., Oaklawn, Ill.

SONGWRITERS Wanted! Send song material for recording consideration. Tin Pan Alley, 1650-P Broadway, New York 10019.

PLAYER Piano books. Free catalog. Vestal Press, Vestal 11, N.Y. 13850.

POEMS Wanted for new songs and records. Send poems. Crown Music, 49-C West 32, New York 1.

ACCORDION Top brands. Buy direct. Tremendous discounts. Trade accepted. Free brochure PM. Accordion-O-Rama, 874 Broadway, NYC.

DRUMS. Electric guitars, amps, organs. Free catalog M. A.L.A.S. Import Company, 31 East 18th Street, NYC.

ACCORDIONS. Guitars, band instruments! Save to 50%. Famous makes. Easiest terms. Trades accepted. Free home trial. Free discount catalog. Mention instrument. International Music Mart, 5535-R Belmont, Chicago 60641.

POEMS Wanted for new songs and records. Send poems. Five Star Music, 6M Beacon, Boston 8, Mass.

SONGS. Poems wanted! Accepted songs published, recorded at our expense! Ted Rosen, 17-PM Longwood Road, Quincy, Mass.

SONG Poems Wanted! Collaborate with professional songwriters equally. Share royalties. Songwriters Contact, 1619-D, Broadway, New York 19.

ACCORDION Manufacturing, 6343-P South Ashland, Chicago Illinois 60636. Piano Accordions, Chromatics, Hohners, Concertinas, Wholesale catalogs free.

GUITAR Making books, materials, accessories, catalog 10¢. H. Brown, D-144, Box 15444, Tulsa, Oklahoma 74112.

INCOME Guaranteed two years for song-poems accepted! Free public releases! Castle's, 203PM West 46th Street, New York City 10036.

STANDARD Musical notation explained and demonstrated in "How to Put a Melody on Paper" \$5.00. Musicraft Material, 1535 N. Gardner St., Hollywood, Calif. 90046.

SINGERS. Students, speakers: Write for revolutionary book (English written) self-educated perfect free voices, easily quickly. Learn many voice secrets. Airmail banking US \$10, check to Francisco Aranda's name. Address: Rua Invalidos, 18-1001, Rio de Janeiro 2C58-Brazil, (agents wanted)

GUITAR Learned quickly with records. Free details. Dixie's, 326M Bidney, Burlington, North Carolina 27215.

SWISS Musical movements. Mechanical electrical. Spielman, 131 West 42nd, New York 10036.

EDUCATION AND INSTRUCTION

BOOKKEEPERS. Operate your own "Dollar-A-Week" system. Ellis, Box 200, Cedar Grove, North Carolina.

PIANO Tuning pays. Big money in spare time. Learn at home. No musical knowledge necessary. Phonograph, records, tools and instructions furnished. Electronic tuning also taught. Free catalog. Capital Tuning School, 3160 S.W. 16th Court, Ft. Lauderdale, Fla.

MISSOURI Auction School. Free catalog! 1330-03 Linwood, Kansas City, Mo. 64109.

FCC License in 6 weeks. First class radio telephone. Results guaranteed. Elkins Radio School, 2603D Inwood, Dallas, Tex.

DETECTIVE Course. Free information. Universal Detectives, Box 8180-F, Universal City, California. 91608.

SWEDISH Massage and Physical culture pays big profits. Learn at home. Diploma. Free catalog. National Institute. Dept. E96, 307 North Michigan, Chicago 1.

LEARN Auctioneering. Term soon. Free catalog. The Reisch American School of Auctioneering, Inc., Box 850, Mason City 1, Iowa.

LEARN Asleep or awake! Records, tapes, equipment! Free catalog! Drawer, PM-400, Ruidoso, New Mexico 88345.

AUTOSUGGESTION. Sleep-learning headquarters! Tapes, records, books. Giant catalog free. Research Association, Box 24-PM, Olympia, Washington.

FREE Sleep-learning catalog. Fletcher, 2407 Catherine, Dallas, Texas 75211-PM.

PIANO Tuning quickly learned with home study course. Diploma granted. American Tuning School, Gilroy, Calif.

USED Courses! Books! List 10¢. Smith's, 124 Marlborough, Salem, Mass.

FREE Bible course. Degree, PM. 143 South Gregg, Charlotte, N.C. 28208.

BE A real estate broker. Big Earnings. Free catalog. Weaver School of Real Estate, 3519-P Broadway, Kansas City, Missouri 64111.

LEARN Civil and criminal investigation at home. Earn steady, good pay. State age. Institute Applied Science, 1920 Sunnyside, Department 169, Chicago, Illinois 60640.

GET A British degree. Divinity, Philosophy, Radionics, 35 courses. Prospectus free. Brantridge Forest School, "Lodge" Brantridge Forest, Balcombe, Sussex, England.

USED Correspondence courses and books sold and rented. Money back guarantee. Catalog free. (Courses bought.) Lee Mountain, Pisgah, Alabama.

HIGH School diploma at home. Licensed teachers. Send age, highest grade completed for free detail. No salesman will call. Southern States Academy, Professional Bldg., Dept. 16, Decatur, Ga.

PENMANSHIP Corrector. Improve poor penmanship quickly. Details free. Ozment, Box 665-34, St. Louis 88, Mo.

MINISTERIAL Home study course. Free qualifying examination. Soms, 5955 Powdermill Road, Kent, Ohio.

ENGINEERING And Electronics—send \$1.00 for 100 page career opportunities. C.I.S.T., Suite 804, 263 Adelaide St., West, Toronto, Canada.

PENMANSHIP Book: Improve ornamental writing and poor writing quickly. Details free. T. Tevis, Chillicothe, Mo.

COMPLETE Your high school at home in spare time with 69-year-old school. Texts furnished. No classes. Diploma. Information booklet free. American School, Dept. X645, Drexel at 58th, Chicago, Illinois 60637.

INVESTIGATOR'S Course. Credentials, diploma. Free information. Southwestern Institute Criminology, Box 201, Geronimo, Oklahoma.

"APARTMENT Management" Extra income or new career. Full time, or part time employment. New job opportunities everywhere. Send for free brochure. Ruth B. Krebs Associates Training School, 8155 Van Nuys Blvd., 204 P.M. Panorama City, California 91402.

SWEDISH Massage. Foot technique. Post graduate. Home study. Residential. Diploma. Dr. Swanson's Illinois Licensed School, 3809-PL Alta Vista, Chicago 13.

LEARN Retail meat cutting. Approved course. Retail groceries. Southwestern College of Meat Cutters, 304 S. Klein, Oklahoma City, Oklahoma 73108.

MEN Wanted. Earn \$125 a week and up. Master a trade with a future. Learn auto diesel mechanics in our shops. You learn with tools on real equipment. Earn while you learn. Many of our graduates earn \$125 a week and up. Write for free bulletin: Dept. 258, Auto Diesel College, Nashville 3, Tenn.

MASTER Watchmaking at home. Free sample lesson. Chicago School, Dept. YJ, Fox River Grove, Illinois 60021.

LEARN Construction estimating at home. Eight-months course sponsored by American Builder, oldest and best building magazine, teaches you every phase of construction estimating from excavating to painting in 15 clear, easy lessons. Instructors grade your work and guide you all the way. Free use of building library; diploma on completion. Costs little; pay as you learn. Free brochure and enrollment form without obligation from American Builder Correspondence School, Suite P96, 1809 Capitol Ave., Omaha, Neb. 68102.

BECOME Tax consultant. Our students earn \$1,000—\$3,000 every tax season preparing returns evenings. Accredited. State approved. National Tax Training School, Monsey R-2, New York.

HOME Study courses—drafting, design. Zero Engineering, 2437 West 69, Chicago 60629.

LEARN Handwriting analysis. International, Box 700, 11749 Eldridge, Lakeview Terrace, Calif.

PROFITABLE National Camera Repair School training at home! PM7, Englewood, Colorado.

DRIVE Tractor—Trailer. Send \$1.00 for full particulars. Driver Training Institute, 794 Bedford Avenue, Brooklyn, N.Y.

DRAFTING (Electronic, Mechanical, Architectural, Art). Home courses \$25.00. Send \$2.00 first lesson. Prior, Inc., 23-09 169 Street, Whitestone 57, New York.

OWN Collection agency. "Little Gold Mine!" Franklin Credit, Roanoke, Virginia.

FOR INVENTORS

IMMEDIATE Cash for patent applications. Free patent searches. Write for details. Universal Patents, 184-D, Marion, Ohio.

PATENT Searches. Including copies of related U.S. patents. \$6.00. Inventors, attorneys, manufacturers use my "worldwide" airmail service! "Invention Record" form and "Information Every Inventor Needs," sent free! Miss Hayward, 1029P Vermont, Washington 5, D.C.

U.S. Patent Office Searches. 234 Broadway, Room 3615, New York. Free invention certificates.

PATENT Searches including Maximum speed, full airmail report and closest patent copies. \$6.00. Quality searches expertly administered. Complete secrecy guaranteed. Free Invention Protection forms and "Patent Information." Write Dept. 15, Washington Patent Office Search Bureau, 711-14th, N.W., Washington 5, D.C.

PATENT Application financing. Free patent searches. Global Patent Division, 2420 77th, Oakland 5, California.

INVENTORS: Your ideas and inventions (patented; unpatented) expertly searched and developed for commercial appeal and cash/royalty sales to manufacturers by professional Invention Developer with excellent record of experience. B.S. Industrial Engineering; U.S. Patent Office former Patent Examiner; U.S. Government former Patent Adviser. Second decade of reliable service! Free "Invention Record" and Important Information. Airmailed! Write Raymond Lee, Invention Developer 130-N West 42nd, New York City 10036.

PATENT And invention development. by licensed professional patent engineer and U.S. Patent Office former examiner, and engineering specialists. Your inventions and ideas engineered for patent protection and commercial value. Inventions developed by us negotiated for cash or royalties with our nationwide contacts. Send for free protection "Invention Certificates" and further interesting, valuable patent information. George Spector, Licensed Professional Patent Engineer, Woolworth Building, New York.

ECONOMICAL Services: Professional patent drawings. Application kits. Question answering. Free search. Send \$2 for protection kit. Flipper, Geneva, Illinois.

INVENTORS: Assistance with any problem. Searches. Applications prepared. All types. Design, chemical, mechanical. Time payment plan. Free information, write: International Invention Institute, Dept. 25, 160 Broadway, New York, N.Y. 10038.

INVENTORS: Assistance with any problem. Protection, promotion, searches. Financial assistance. Strictest confidence. Free Record of Invention Forms, information; New York Invention Service, Dept. 1, 160 Broadway, New York, N.Y. 10038.

INVENTIONS Needed immediately for manufacturers. For additional information write Kessler Corporation, C-59-FI, Fremont, Ohio.

PROFESSIONAL Patent searches, \$6.00. including official U.S. Patent Office copies of related U.S. patents! Prompt, dependable service. Certified, airmailed! For free "Invention Record Folio" and important patent information every inventor should have, write: United States Inventors Service Company, 501-P Thirteenth Street NW, Washington, D.C. 20004.

INVENTIONS WANTED

INVENTIONS Wanted. Patented; unpatented. Tremendous manufacturers lists. Global Marketing Service, 2420G 77th, Oakland 5, California.

INVENTIONS Wanted patented, unpatented. Put your ideas to work. Tremendous manufacturers lists. For information write: John K. Suggs, P.O. Box 204, DeKalb, Ill.

INVENTORS Needing help with any problem—financing, protection, securing manufacturer, searches. Contact the organization with "know-how." Be completely informed. Pioneer Invention Service, Dept. 83, 150 Broadway, New York, N.Y. 10038.

INVENTORS: Protect your ideas! Free "Recommended Procedure." Washington Inventors Service, 422P, Washington Building, District of Columbia 5.

INVENTORS! Don't sell your invention, patented or unpatented, until you receive our offer. Eagle Development Company, Dept. H, 79 Wall Street, New York 5, N.Y.

WE Either sell your invention or pay cash bonus. Write for details. Universal Inventions, 298-E, Marion, Ohio.

INVENTION WANTED for directory of ideas, patents, inventions. Daoust Research, 3138 Wilson, Chicago, Illinois 60625.

INVENTORS! We will develop, sell your idea or invention patented or unpatented. Our national manufacturer-clients are urgently seeking new items for highest outright cash sale or royalties. Financial assistance available. 10 years proven performance. For free information write Dept. 47, Wall Street Invention Brokerage, 79 Wall Street, New York 5, N.Y.

INVENTORS—If you have an invention for sale, patented or unpatented, wire for free brochure outlining manufacturer's requirements. Royalty rates. Kessler Corporation, C-59-IW, Fremont, Ohio.

INVENTORS Wanted: Manufacturers need new items! Your inventions, ideas developed for cash/royalty sales. Free "Invention Record"; Information. Raymond Lee, 130-P West 42nd, New York City 10036.

MANUFACTURING

MODELS—Small lot manufacturing. Metals, plastics, etc. Milburn, Burlington, Kentucky.

INVENTORS. Services. Models. Manufacturing. Research. Consultants all fields available. Free brochure, William Parker, 32 Westminster, Worcester, Mass. 01605.

BIRCH Plywood—Any size, shape, specification. Violette Plywood, Lunenburg, Mass.

BUY IT WHOLESALE

HEARING Aid batteries wholesale. National Wholesale Battery Company, P.O. Box 825, Wichita, Kansas 67201.

NEW 6-Color Deluxe below wholesale catalog. Automobile catalog and others. Housewares, clothing furs, furniture, rugs, appliances, refrigerators, washers, dryers, vacuum cleaners, polishers, cookware, dinnerware, strollers, cribs, radios, stereos, phonographs, records, recorders, cameras, film, projectors, musical instruments, organs, typewriters, books, binoculars, luggage, sporting goods, bowling, golf, game tables, power/rider mowers, garden tractors, boats, motors, bicycles, clocks, watches, diamonds, jewelry. Huge discounts to \$1,000.00 on new automobiles. All makes. Free details. Write today: Worldwide Bargainhunters, Box 730-A, Holland, Michigan.

BARGAINS! Buy wholesale and below. Name brands. Appliances, furniture, sports equipment, televisions, cameras, watches, jewelry, thousands more. Huge discounts to \$1,000.00 on new automobiles. All makes. Free details. Write today: Worldwide Bargainhunters, Box 730-A, Holland, Michigan.

WORLD'S Largest wholesale supply. Buy from 7853 American, European, Japanese wholesalers. Hong Kong tailormade suits, 123 dropship catalogs, Rockbottom prices. Automobiles. Free details. International Buyers. Post Office Box 4061, Colorado Springs, Colorado 80909.

100,000 BARGAINS! Wholesale! Close-outs! Imports! Wholesalers. 1265-M Broadway, New York 1, N.Y.

BIG 324-page color wholesale catalog. Send just \$1 (Refundable). Veldon Company, 401 Center Avenue, Pittsburgh, Pennsylvania 15215.

GET 10 Wholesale catalogs, \$1. Choy-wong, 166 Bernhardtstraat, Aruba, WI.

FREE Catalog. 500 fantastic bargains. International Distributing Company, 61-C Queens Avenue, Atlantic Beach, New York 11509.

BARGAINS! Buy wholesale! Save money! Free catalog! Norris, 273 Merrick, Dept. 215, Lynbrook, N.Y.

EXPORT-IMPORT

"EXPORT-Import without capital" \$5.00 Hong Kong directory, 1,000 addresses. Also Japan, Germany, Italy, \$2.50 each. "Import" Journal \$1.00. All 6 books \$12.00. EJP Publications, 25 Thames Crescent, Maidenhead, England.

JAPAN: Mail-Order 26 page catalog, dolls, novelties, Manufacturers' names, addresses \$1.00; 1000 products illustrated trade directory \$3.00. Send cash. Yamagata Office, 814 Togin Bldg., Marunouchi, Tokyo.

FOR THE HOME

AMERICA'S Best faucet sealer. Literature, Jordan's, 743 Dorrance, Philadelphia, Pa. 19146.

OF INTEREST TO WOMEN

MAKE Extra money—show friends, neighbors—gifts, stationery, Christmas, all occasion cards. Experience unnecessary. Salable samples on approval, free catalog, free name imprinted Christmas card album. Hedenkamp, 361 Broadway, Dept. PM-91, New York.

WOMEN! Make big money at home. \$10.00 profit in an hour possible with invisible mending. Make holes, tears disappear from clothing, fabrics. Steady year-round demand from cleaners, laundries, homes. Details free. Fabricon, 1533 Howard, Chicago, Illinois 60626.

MAKE Gorgeous original candles for all holidays and special occasions. Learn expert Candle decorating, candlemaking, use of professional molds. Free details on home instruction method. Candle Institute, Box 54-1B, Redondo Beach, California 90277.

RUN Spare time greeting card-gift shop at home! Show friends samples of new 1986 Christmas, All-Occasion greeting cards, gifts! Take orders. Earn to 50% profit! No experience needed. Try without cost! Special fund-raising plans for organizations. Rush name for samples on approval. Regal Greetings, Dept. 173-P, Ferndale, Michigan 48220.

FREE Make 'em and save leathercraft idea manual. Tandy Leather Co., 1001 Foch, C57, Fort Worth, Texas.

\$200.00 MONTHLY Possible. sewing babywear! Write: Cuties, Warsaw 9, Indiana 46580.

3 OLD Southern barbecue recipes, \$1. 200 Tulane, Clinton Mississippi.

\$45.00 THOUSAND My Way, compiling lists. Addressing from them: Longhand, typewriter. Information, stamped, addressed envelope, Brewster, Box 1626-J, Clearwater, Florida 33515.

DRIVE New car, wear new clothes, buy color TV. Get daily cash income. Put spare hours to work. Write for 5 months free subscription Opportunity Magazine; see hundreds easy ways to make money. Opportunity, Dept. 17-GO, 450 N. Dearborn, Chicago.

SEED Picture patterns; rooster and hen mailed at 50¢ each with list. Seed Pictures, Box 7PM, Walnut Ridge, Arkansas.

CHRISTMAS Wholesale catalog, 25¢. Fair Sales-PM, Box 5152, Kingsport, Tennessee.

HOME Typing—\$95, weekly possible. Instructions with employers list, \$1.00. Easton Company, 543-A, Hopland, Calif.

BUTTONS 800, \$1.80. Quiltpatches 300, \$1.00. Nylolaces 40 yards, \$1. Schaefer, Champlain, N.Y.

\$100 WEEK Possible! Home typing. Full or part time. Complete instructions, \$1.00. Helmer, Box 523, Downtown Omaha, Nebraska 68101.

MAKE Money zip coding at home. Information free. Automated Mail, Dept. 129, Stamford, Conn. 06904.

LEARN Expert cake decorating, candy making. Free details on home instruction method. Candy & Cake, Box 34-AMI, Redondo Beach, Calif. 90277.

HOUSEWIVES, Teachers, students, office workers. If you need extra cash each week but household or other duties prevent you from taking a part-time job, learn how you can earn by accepting orders to Popular Mechanics. Good Housekeeping and all other magazines. No experience needed. Write Popular Mechanics, Room 9-W, 250 West 35th St., New York 19, New York.

WATCHES, OLD GOLD, JEWELRY

CASH Immediately for old gold, jewelry, gold teeth, watches, diamonds, silverware, spectacles, platinum, mercury. Free information. Rose Industries, 29-A East Madison, Chicago 2.

WATCH And clock repairing books. Free catalog. North American, Box 77-AW, Fox River Grove, Illinois 60021.

USED Pocket watches—as is—\$5 for \$25.00. Joseph Bros., 5 South Wabash, Chicago 60603.

WATCHMAKER'S-Jewelers supplies, instructions. Catalog 50¢. Bengal's, 10717 Venice, Los Angeles 34, California.

HIGHEST Cash for Gold, Jewelry, Gold Teeth, Rings, Diamonds, Watches, Silver, Platinum. Mail articles today. Free gift with information. Chicago Gold & Precious Metals 6 E. Monroe, Dept. 158, Chicago 60603.

WATCHMAKERS Tools, materials, supplies, watches. Catalog. Gales, Box 1000, Chicago 90, Ill.

WANTED, Gold, silver, platinum, scrap (any form), coins. Information free. Willmot's, 1067-D Bridge St., Grand Rapids, Michigan 49504.

USED Brand name watches \$5 up. Free list. Southern Watches, 3-PM South Wabash, Chicago 60603.

WEARING APPAREL

YOUR Ad in this space will be read by more than 1,400,000 active mail order buyers. Join the march to greater profits, place your products and services in front of them today with a small low cost classified ad. For further details, write: C. A. Martin, Dept. 15N, Popular Mechanics, 575 Lexington Avenue, New York, New York



SCIENCE AND CHEMISTRY

AMAZING New book of science experiments, formulas, and catalogue of laboratory supplies. Only 35¢. National Scientific Co., 13 S. Park Avenue, Dept. PM-9, Lombard, Illinois.

FIREWORKS Supplies, casings, end caps, plugs, chemicals, fuse, do-it-yourself kits. send 35¢ for samples and catalogue—Ecco, Box 189, Northvale, New Jersey 07647.

CHEMICALS Apparatus, Biology, Catalog 25¢. Mid-States Scientific, 7053 N. Clark, Chicago, Ill.

SEARCHING For economically priced chemicals and apparatus? Gifts with catalogue, 25¢. Starr Scientific, Manitowoc, Wisconsin 54220.

CONTACT Explosive. Explodes with touch of leather. Handled safely wet. Powerful. Applies like paint. Made from household chemicals. Results guaranteed. Complete instruction for making both kinds only \$1.00. Franks Scientific Company, P.O. Box 156, Martelle, Iowa 52305.

ROCKETS, Single, multi-stage kits, parts amazing Accelerometer. Illustrated catalogue 25¢ Rocket Supply, Box 51B, Tappan, New York 10983.

ILLUSTRATED Catalog: Chemistry, mineralogy, biology 25¢. Tracey Laboratories, Evanston, Illinois.

PROFESSIONAL Firecracker fuse, burns underwater, 75 feet, \$1. Fireworks, explosives formulas, free information. Edcolabs, Box 99, Berlin, New Jersey 08009.

FIREWORKS—Explosives—detonators. New manual reveals formulas, preparations, only \$2. Free with order, \$2 certificate for fuse. Pyrochem, Box 169, Berlin, New Jersey 08009.

ROCKETS: Real flying models—flights up to 2500 ft. New illustrated catalog 35¢. Single and multistage kit, cones, engines, launchers, trackers, rocket aerial cameras, technical information, Fast service. Estes Industries, Penrose 7, Colorado.

SKYROCKETS, Firecrackers, fireworks—Make your own! 60 simple formulas \$1.00; 30 smoke formulas, 13 colors \$1.00; 10 fuse formulas 50¢. Paloma Pyrotechnics, Box 247, Auburn 5, California.

REALISTIC "Volcanos" Ignite with flare, showering green embers. Complete kit and chemical catalog, \$1.50. MB, Box 1922 Phila., Penna. 19103.

ROCKETS, Kits, engines, supplies! Catalogue, 25¢. Krueger Rocket Company, 6428 South Main Street, Downers Grove, Illinois 60515.

LIQUID Rocket, Plans, \$2.98. Amateur rocketry magazine, 50¢. Star Space Systems, Box 4353, Inglewood, California.

CHERRY Bomb fuse, water proof, 25 feet with formulas, instructions \$1.00—125 feet \$4.50 Postpaid. Free catalog. Zeller, Box 638, Hudson, Michigan.

3 SOLID Fuel aluminum rockets, \$1.00. Pyrotech, Box 701, Manchester, Vermont.

TEAR Gas, contact explosive, fireworks formulas, \$1.00. Import, P.O. Box 72, Pottsville, Pa. 17901.

UNUSUAL Chemistry courses, kits! Information booklet, 25¢. National, Box 94, Redwood City, Calif. 94084.

EXPLOSIVES Book. Ever wonder what that putty stuff is, that all the spy and green beret use? Plastic explosives in high-low-boom! Copyright 1966. Complete digest of U.S., Nazi, military, industrial, explosives. Chemical preparations of powders, dynamites, TNT, RDX, Tetrayl, nitroglycerin, many more. Blasting techniques, ammunition components, safety precautions, design, formulation, of fireworks. Diagrams, illustrations, shells, devices. (AR-15 grenade). Not a cheap mimeograph, duplication, list, etc., specially written to contain information in books as expensive as \$68.00. Multi-color printing, excellent binding, \$5.50 postpaid. Bridgeview Gun Sales, 2917 Southfield Drive, Oaklawn, Illinois 60455 Dept. PM-1.

FREE. Science catalog, Chemicals, Glassware, Physics, Biology. Allen Laboratories, Box 1263, Mansfield 1, Ohio.

CONTACT Explosive. Explodes from slightest touch. Safe. See next advertisement.

SEYROCKETS. Fireworks—Easy to make! Complete instruction manual; 28 types—high altitude rockets, aerial displays, roman candles, fountains, whistles, fireballs, flaming balloons, \$1.00; 75 formulas—contact explosives (complete instructions), propellants, flaming stars, colored flares, smokes, fuses \$1.00. Satisfaction guaranteed. Sentec., 433-A3, Ellis St., San Francisco 2.

DO-It-yourself gunpowder kit, all chemicals and instructions for making over 2 pounds of high grade gunpowder plus fireworks catalogue. \$4.95 postpaid—Christy, Box 85, Bergenfield, New Jersey 07621.

ROCKETS! Flight kits, testing equipment. Catalog 25c. Rocket Development Corporation, Route 3, Seymour, Indiana 47274.

FORMULAS, PLANS, ETC.

10,103 FORMULAS, \$1.00 shipped postpaid. Sword Publications, Box 4142-MC, Omaha, Nebr. 68104.

LATE. Modern manufacturing formulas. List free. Moon Chemical, Martville, New York.

ENCYCLOPEDIA of formulas. Details free. Cassill, Box 1535, Eugene, Oregon 97401.

FORMULAS—All kinds. Amazing big catalog. 10c. Kemikal, Park Ridge, Ill.

FOR Proof of what you can do in specialty manufacturing get our literature. It's free! Miller, Chemist, 1517-P, Tampa, Florida.

PLASTICS

NEW Liquid casting plastic clear colors. Embed real flowers, butterflies, photos, coins. Send 25c for two handbooks "How to Cast Liquid Plastics" and "How to Make Extra Money at Home" Castolite, Dept. 86-101-K, Woodstock, Illinois.

BOXES. Plastic. 200 sizes. Free list. Althor, 2260 Benson Ave., Brooklyn, N.Y.

COMPLETE Laminating business. Finest, most profitable. American Machine, 1128 Dana, Chattanooga, Tennessee 37343

PLASTIC Embedders, jewelry workers. We have everything. Findings, moulds. New catalog 25c. David Co., 861 Broad St., Dept. M, Providence, R.I. 02907

PLASTICS for arts & crafts, fun & profit. See how easy it is to work with liquid plastics. Turn your plastics hobby into \$ for you. Send 50c for catalog to PMI, 1644 20th, Santa Monica, California

TREASURE FINDERS

BEFORE Buying a metal detector, find out about Sensitronix's new "Electronic Prospectors"—the latest development in treasure and coin detection equipment. Trade-ins accepted. Free information and treasure hunting guide. Sensitronix, 2225-C Lou Ellen, Houston, Texas 77018.

COMPLETELY New prospecting technique developed by Relco. New transistor models detect buried gold, silver, coins, treasures. \$19.95 to \$129.50. Write for free catalog and "guide for beginners" Relco-A40, Box 10563, Houston 18, Texas

NUCLEAR Locators! Coins, relics! write Howe, 811-C Kansas, Atchison, Kansas.

METAL Locator kits and assembled models from \$39.90. Terms. Transistorized models available. Free catalog. Electronic Applications, Dept. M, Box 6095, Alexandria, Virginia.

POWERFUL Metrotech locators detect gold, silver, coins, relics. Moneyback guarantee, terms. Free information. Underground Explorations, Dept. A, Box 793, Menlo Park, California.

TREASURE. Gold, silver, relics. New 1966 detectors now available. Free information, Rayscope, Box 715, North Hollywood, California.

FUN & Profit finding buried treasure, relics with transistor M-scope. Booklet, interesting customer comments free. Terms, Fisher Research, Dept. AAX, Palo Alto, California 94302.

SAVE! Build transistorized treasure finder. Details free. Del Research, Box 436B, Centerville, Georgia 31093.

NEW Revolutionary selective transistorized metal detector. Push button tuning, automatic tuning, etc. Many models. Free catalog. Gardiner Electronics Co., Dept. 9, 4729 N. 7th Avenue, Phoenix, Arizona 85013.

NEW 1966 Goldak treasure, coin, gold, silver locators. Goldak, Dept. PMC, 1544 W Glenoaks, Glendale, Calif. 91201.

BUILD Your own commercial type detector. Find buried treasure, gold, silver, coins. Sensitive four transistor circuit with speaker. Easy picture illustrated instructions. Schematic, parts list, \$5.00 prepaid. Janeston Electronics, Box-A, Blanchard, Oklahoma 73010.

TREASURE. Find gold, silver, relics with super, powerful Detection locators. Free information. Detection, Dept. PM-9, P.O. Box 243, San Gabriel, California.

PRECIOUS STONES AND MINERALS

ROCKHOUNDS. Free brochures listing thousands of mountings, cut stones and gemstone rough from around the world, many shown in full color! Make jewelry for profit. It's easy! Gemex Co., Dept. PM, Hwy. 76, Pala, California 92059.

GET Free catalog no serious rockhound, gem cutter, jewelry maker, hobbyist or craftsman can be without. Full of bargains, exclusive items, low prices from largest suppliers and authorities in the field. Free new catalog just off the press, yours for the asking. Write Grieger's, Dept. C-12, 1833 E. Walnut, Pasadena, California.

GOLDSTONE Tie tack plus 175 page rockhound catalog \$1.00. Many pages in full color showing thousands of cut gemstones, mountings, gemstone rough from around the world and all machinery & supplies to make jewelry for profit or fun. It's easy! Gemex Co., Dept. PM, Hwy. 76, Pala, California 92059.

100 COLORFUL, Polished gemstones, \$1.00 Tumblecraft, 5401 James North, Minneapolis, Minnesota 55430.

EARTH Science. Educational magazine. Subscription, \$2.50. Sample, 35c. Box 550-PM Downers Grove, Ill. 60515.

SEMI-Precious uncut gems. Ten different for \$1.00 Request list 30. Prospectors Shop 201 San Francisco, Santa Fe, New Mexico.

CARTOONING, COMMERCIAL ART, SHOWCARD & SIGN PAINTING, TATTOOING

LEARN Sign painting at home. Free talent test. Ben Kerns, Box 812-PM, Greenville, S.C.

LEARN Profitable magazine cartooning. Free details Hartman Box 3097, Lincoln 50 Nebraska.

CARTOONING And commercial art. Easy home-study drawing course. Art background not necessary. Excellent creative money making opportunities part or full time. We show you how. Low monthly tuition. Free booklet. Continental Schools, Dept. 6A-21, 1330 W. Olympic Blvd., Los Angeles, Calif. 90015.

"HOW To Make Money With Simple Cartoons"—Everyone who likes to draw should have this book! Free Send name, zip code. Cartoonists Exchange, 99 Pleasant Hill, Ohio 45359.

SIGN Painting. Fascinating system. Straley, 410 South Western, Springfield, Ohio.

CARTOONERAMA Teaches you cartooning in a new 24 lesson course. Free brochure. CFA, Box 263-6, Branford, Connecticut 06405.

WANTED Cartoonists. Amateurs, professionals. Over 200 markets. Information free. Markets-4-96, 11620 Lansdowne, Detroit, Michigan 48224.

YOU Can entertain with chalk talks. Catalog 10c. Balda the Cartoonist, Oak-kosh, Wis. 54901

ADVERTISING AGENCIES, ADV. SERVICE, MAILING LISTS

MAILING Lists most all kinds 1000 \$5.00. Free folder. Your circulars mailed \$4.00 1000. Dixie Mailers, King, N.C. 27021.

ADVERTISING Ratebook leading newspapers, magazines, free. Chicago Advertising Agency, 28-E Jackson, Chicago 4.

MAILORDER Record Book, 30 pages. Records inquiries, orders, advertising expense, etc. Most complete. Just send dime for postage and handling. C. A. Martin, Popular Mechanics, Dept. RB7, 575 Lexington Ave., New York, N.Y. 10022.

TYPEWRITERS, DUPLICATORS, OFFICE EQUIPMENT

OFFSET. Letterpresses, varitypers, typewriters, mimeograph, multigraph machines. Bargains. DixieGraph, King, North Carolina 27021.

RUBBER STAMPS AND OFFICE SUPPLIES

FREE 32 Page rubber stamp catalog. Signature stamps \$3.50. Youngers Stamp Shop, Princeton, Iowa.

CATALOG: Rubber stamp equipment, supplies. Martin, 1425 Major, Jefferson City, Missouri 65101.

FREE Catalog: Rubber stamps, printing, Dowling Products, Dept. PM36, Pitts-town, N.J.

PRINTING, MULTIGRAPHING, MIMEOGRAPHING, GUMMED LABELS

1000 GUMMED Address labels, \$1.00. Wait's, Box 966-A, South Bend, Indiana 46624.

3000 ADDRESS Labels—\$1.25. Free catalog. Kizer, Green Lake, Wisconsin.

AMAZING Business printing values. Samples Print Shop, Box 576, Greenville, R. I. 02828.

OFFSET Printing. 500 8 1/2 x 11's. \$4.50 Postpaid. 24-hour service. Cisco's, Atlanta, Illinois 61723.

QUALITY Printed business envelopes. Wholesale prices! Samples. Stetson's, Wiscasset, Maine 04578.

1000 THERMOGRAPHED Business cards, \$3.90. Quality stationery printing. Samples. Artercraft, Box 178, Brighton, Mich. 48116.

FREE Booklet—"Secrets of Cutting Printing Cost". Cisco's, Atlanta, Illinois 61723.

FREE Catalog: Business letterheads, envelopes, cards. Weiss and Associates, 213 Sixth Street, Downers Grove, Illinois 60515.

SEND Us your ideas or samples for quotation. Lyle Printing Co., Box 38, Salem, Ohio 44460.

1000 PERSONAL Labels—name, address, zip, 58c, postpaid. Exline Enterprises, 1403B Rose Boulevard, Orlando, Florida 32809.

1000 BUS. Cards, \$3.50. Two colors, \$4.50. Eldee, Allendale, N.J.

OFFSET Printing. 100 copies \$3.00. Business cards. Free samples. Dixie's, 326M Bidney, Burlington, North Carolina 27215.

QUALITY Offset, one thousand 8 1/2 x 11, 20 lbs. Bond \$6.00. Postpaid up to 7 zone. Write for catalog, Biscayne Products, Box 348, New York, New York 10005.

QUALITY Printing: Lowest prices. Samples. Dowling Press, Dept. PM-36, Pitts-town, N.J.

PRINTING & RUBBER STAMP OUTFITS—SUPPLIES

DO Your own printing. Save money. Simple rules. We supply everything. Print for others: good profit. Raised printing like engraving too. Have home shop. Details free. Kelsey Presses, V-11, Meriden, Connecticut.

TYPE Catalog No. 11, 96 Pages. Send One Dollar. Deductible First Order. Acme Type, 732 Federal, Chicago, Illinois.

TYPE And supplies for rubber stamp makers. New wholesale price list No. 3 free. Star Stamp Supply, 732 Federal, Chicago 5, Ill.

RUBBER Stamp presses, hydraulic operated, electrically heated. Sizes 5" x 8", 8" x 12", 10" x 15". Starting outfits, supplies. Printing presses. Orders for presses and supplies shipped same day received. Custom Manufacturing, 402-P, East Elm, Springfield, Missouri.

RUBBER Stamp outfits, supplies. Kiewiet, 2025 Barney Road, Kalamazoo, Mich. 49007.

RUBBER Stamp manufacturers supplies. New products. Low prices. Catalog. Jackson Supply, 1433 Winnemac, Chicago, Illinois 60640.

MAKE Your own self-molding rubber stamps and printing cuts. Plexirubber. Argyle 1, Wisconsin.

REMAILING SERVICE

SO. AMERICA Registered re-airmails. \$1.00. Confidential, reliable. Genaro, Box 360, Guayaquil, Ecuador.

CANADA: Confidential remailing 35 per letter, \$3.00 monthly rates. Box 1135, Station B, Montreal, P.Q., Canada.

REMAILING: Fast! Many services. Free details. Rucker, 909 Buena, Chicago, 60613.

TIMELY Remailing 25¢. Unlimited Monthly \$3.00. Confidential. Postcards. Schoen, Box 1963-P, Chicago, Illinois 60690.

ARABIAN Re-airmails. Receiving and forwarding. Postage, \$1.00. Sadiegle, Box 469, Al Khobar, Saudi Arabia.

SECRET Mail receiving system. Hedepeth, 406-M South Second, Alhambra, California 91802.

HAWAII Secret Address. Remails 25¢. Receiving-forwarding \$3.00 monthly. Postcards, gifts, slides. Uppie, Box 984, Kailua, Hawaii 96734.

SECRET Receiving and remailing. Discreet and confidential. Remail 25¢ single. 8050 S. Main, Houston, Texas.

CONFIDENTIAL Rapid remails 25¢ single, \$3.00 Monthly. Details. Pesco, P.O. Box 6120, San Francisco, California.

COMPLETE. Confidential remails. 25¢ single, \$3.00 monthly. Bill, Box 1788, Phoenix, Ariz.

MIAMI Remails 25¢. Monthly Rates. Marie, P.O.B. 1266, Coral Gables, Florida 33134.

N.Y.C. Remailing 20¢. \$3.00 monthly. Williams, 2100 Mapes Ave., Bronx, 10460.

CANADIAN Address. Details. 10¢. Moore's, Box 37, Wasaga Beach, Ontario, Canada.

FROM Fabulous Las Vegas. Unexcelled, fast, dependable, confidential service. Remails. 25¢. Monthly rates. Colorful cards. Ruthie, 558 Oakley Blvd., Las Vegas, Nevada.

LOS ANGELES. Hollywood, San Fernando Valley—25¢ single; \$3.00 monthly. Confidential, 10437 Lanark Street F. Sun Valley, California 91352.

OLD Established. \$3.00 unlimited monthly. De Graff, Box 14156-P, San Diego, California.

HOLLYWOOD. Los Angeles, confidential remailing. 25¢. Marco, Box 65612, California 90065.

ALASKA Remail. 25¢ single, \$3.00 monthly, confidential. Malone, 274 So. Klevin, Anchorage, Alaska 99504.

REPAIRS AND SERVICING

YOUR Ad in this space will be read by more than 1,400,000 active mail order buyers. Join the march to greater profits, place your products and services in front of them today with a small low cost classified ad. For further details, write: C. A. Martin, Dept. 15N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

SPECIAL SERVICES

INFORMATION. Any subject. Products, people, geography \$1.00. Box 5996, Reno, Nevada 89503.

INFORMATION On anything. Ferguson Research Specialists, 83-45 Victor Ave., Elmhurst, N.Y. 11373.

WE Locate anything you need for a reasonable fee. NBARS, 9325H, Menard, Oaklawn, Ill. 60453.

TOBACCO

YOUR Ad in this space will be read by more than 1,400 active mail order buyers. Join the march to greater profits, place your products and services in front of them today with a small low cost classified ad. For further details, write: C. A. Martin, Dept. 81N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

RAZORS

YOUR Ad in this space will be read by more than 1,400 active mail order buyers. Join the march to greater profits, place your products and services in front of them today with a small low cost classified ad. For further details, write: C. A. Martin, Dept. 82N, Popular Mechanics, 575 Lexington Avenue, New York, New York 10022.

WANTED—MISCELLANEOUS

MERCURY. Gold. Silver. Platinum: Ores assayed. Wholesale Terminal, Norwood, Mass.

PERSONAL

INVESTIGATORS. Free brochure, latest subminiature electronic surveillance equipment. Ace Electronics, 11500-P NW 7th Ave., Miami, Florida 33168.

BLITZ Reducing! 5 pounds overnight! Guaranteed! Bijou, Box 1727-BM, Hollywood, California 90028.

BORROW \$1,233 Airmail! Repay \$54 for 29 months. State licensed. Postal Finance, Dept. 17-P, Kansas City, Kansas 66117.

BIBLE Questions answered. Stamped envelope. Evlon, 17167 Bentler, Detroit, Michigan 48219.

SUBCONSCIOUS Conditioning remakes personality while you sleep. Free details. Sleep-Learning, Box 34N, Olympia, Washington.

SURVEILLANCE Equipment. New 1966 models. Free details. Write: Security Electronics-PM, 11 East 43 Street, N.Y.C. 10017.

LOW-Cost loans by mail. \$6.00 monthly repays \$104.50; \$56 monthly repays \$1,321.39. Borrow any amount. Guaranteed fast, confidential. Write today! Bankers Investment, 67-D, Box 1648, Hutchinson, Kansas 67501.

BORROW \$100 To \$1000 by Mail. Quick, easy, private. No co-signers. Repay in 36 small monthly payments. For the amount you want write today to: Dial Finance Co., 410 Kilpatrick Bldg., Dept. 9-214, Omaha, Nebraska 68102.

BILL Problems? Poor credit no trouble. Not a loan company. Send for free application. Automatic Acceptance, 307PM P-cassett Ave., Providence, R. I. or 318PM Broadway Blvd., Reno, Nevada.

LOANS By mail. \$100-\$1000. Anywhere. Confidential. Write Union Finance, Dept. PM, 222 W. Osborne, P.O. Box 7457, Phoenix, Arizona.

LOW Cost loan? Solutions to all financial problems. Non-lending plan. Amazing results. Free details. Write Financial Consultants, 28 E. Jackson, Suite 1204-PM, Chicago 60604.

SECRET Law wipes out your debts. Easy to use. Immediate relief. Free details. Counselor, Harlingen 7, Texas.

RUPTURED. Relief and comfort. No understraps, elastic or steel. Write Hand-Lock Products, Preston 4, Ont., Canada.

MISCELLANEOUS

LOG Cabins: Ship anywhere: 35 plans, specifications and prices. Send \$1.00. Write Bloch Brothers, Waterford 4, Michigan.

LOANS By mail. \$100-\$1000. Anywhere. Confidential. Write Union Finance, Dept. PM, 222 W. Osborne, P.O. Box 7457, Phoenix, Arizona.

BIRTH Certificates. Marriage Certificates. Diplomas! 2 blank forms \$1.00. Sample 10¢. Standard Forms, Box 482-M, Washington, D.C. 20044.

"CIGARETTES" — (Roll your own). Pipe, Chewing, Smoking tobaccos. Facts free. Write Fred Stoker, Dresden, Tennessee.

KILL Mosquitoes, crop destroyers. Electronically. Free information. Box P, 204, Metamora, Michigan 48455.

YOUR Name sent to 1000 importers, publishers, mailers, wholesalers, etc. on our mailing list. Year \$1.00. Dixie Mailers, King, N. Car. 27021.

WINEMAKERS. Free illustrated catalog of yeasts, equipment, Sempex, Box 7208, Minneapolis, Minn. 55412.

HEARING Aid batteries wholesale. Free list. Habs, Box 51, York, Penna.

WINEMAKING . . . Grape, Elderberry, Dandelion, frozen juices, etc. Brewmasters' secrets revealed! Powerful methods! Complete instructions, recipes, \$1.00. Continental, Box 26034-PI, Indianapolis, Indiana 46226.

ZIP Code directory \$1.25, E. Lutchkus, P.O. Box 213, Carlisle, Pa. 17013.

HOME Winemaking . . . with fruit or frozen juices! Free illustrated catalog, recipes, supplies. Winemakers, Box 18216-PI, Indianapolis, Indiana 46218.

BOOKS On antiques and their prices. Free circular! P. Warman Publishers, Uniontown, Penna.

SUPER Memory overnight! Success guaranteed! Bijou, Box 1727-M, Hollywood 28, California.

NOW! Any photo exactly reproduced stamp size. Self Sticking. Satisfaction guaranteed. Fifty photos only \$2.00, original returned unharmed. Collins, 2400 Davidson, Bronx, New York 10468.

VENTRILOQUISM! Information free! Dummy catalog, 25¢. State age, Maher, Studio I, Box 36, Kensington Station, Detroit 24, Michigan.

MAKE Copies of your favorite polaroid pictures for about 2¢ each. No special equipment, skill or darkroom needed. Simple instructions \$1.00. H. W. Hollingsworth, Mango, Florida.

MAKE Wines, beers, liquors 32-pages-instructions. \$1.00. Modern, Box 9203-P, Arlington, Virginia.

FLASH Light battery saver. Patent papers and drawings available. Sweetzer, Vail, Arizona.

\$130 PROFIT Race Day average with \$50.25. Years results. Details: Hitchings, Box 5715-PM-A, Carmel, Calif.

ORNAMENTAL Iron designs. Book of 1800 beautiful, practical designs for railings, columns, etc. Free literature. Cunningham, 3861 South 3200 West, Salt Lake City, Utah 84119.



The clean 22: A Remington "Hi-Speed" with its "golden" bullet.

Clean because every "golden" bullet is coated with a specially formulated high-temperature lubricant. Unlike ordinary grease-coated bullets, it shuns dirt, grit and lint like the plague. Prevents these particles from reaching your gun to cause a jam or misfire.

So every "golden" bullet goes into your chamber clean, sizzles out of your

barrel with full power. (A "Hi-Speed" 22 has more velocity at 50 yards than ordinary 22's have at the muzzle.)

We originally developed the clean 22 to make 22 automatics feed smoother and surer. (Which it does in fine style.) But you'll also find that a Remington "Hi-Speed" with its "golden" bullet is powerful medicine in any action.

There's a special plating that resists nicks, scrapes and scratches. Gives you all the accuracy you paid for.


And exclusive non-corrosive "Klean-bore" priming. It can add years to the

life of your barrel.

All for the same price as ordinary grease-coated 22's.

You can call these remarkable rim-fire cartridges clean 22's. Or dry 22's. Or "Hi-Speed" 22's. Or "golden" bullet 22's. But call for them at your Remington dealer's. In shorts, longs or long rifles, solid or hollow point.

"Klean-bore" is Reg. U.S. Pat. Off. and "Hi-Speed" is a trademark of Remington Arms Company, Inc., Bridgeport, Conn. 06602. In Canada: Remington Arms of Canada Limited.

Remington 

The clean 22.





**YOU
NAME
IT**

ANYTHING YOU WANT TO CALL YOUR OWN

... gets identified in seconds with a new, completely automatic BVI Electric Pencil. It lets you engrave your name or other information on metal, wood or plastic surfaces as easily as you write with a regular pencil.

BVI Electric writing is clean. Permanent, too. Can't be smeared, erased or rubbed off. Durable steel point vibrates at 7200 strokes a minute. Adjustable knob lets you change the length of your stroke or the width of your line.

Completely safe for every member of the family to use. Turns on when you pick it up, off when you set it down. Practical and lots of fun. Lets you neighbor-proof your property—monogram or decorate household goods, sporting equipment, garden gear, your children's possessions and hundreds of other items. How did you get by all these years without it! **Only \$8.95**

See it today at your nearby hobby, hardware or department store ... or write



BURGESS VIBROCRAFTERS, INC.

Grayslake, Illinois

** Manufacturers of electric marking devices and paint sprayers*

BY KEVIN V. BROWN
AVIATION
 JETSTREAM

World records are hard to establish sometimes, but you have to start somewhere.

Dorothy Reeves is a California teen-ager who admits to being a tomboy. Recently she and her family visited Cone Peak, 5100 feet up in Los Padres National Forest where she launched a bagful of five-cent balsa gliders. She wrote her name and address on some of them, and, because it was a calm day, she could watch them



DOROTHY REEVES, world-champion glider thrower

soar in the thermals for as much as 10 or 15 minutes before they disappeared.

That would have been the end of it except that three days later she got a letter from a Charles Van Dyke of Salinas, Calif., who said he saw one of her gliders float to earth in front of his house. It was the day after the glider was launched and Salinas is 50 miles from Cone Peak.

No almanac carries distance records for five-cent toy gliders, but Dorothy Reeves of Oakland, Calif., may be a world champion. She had better look to her laurels, however. At last report, her young brother was writing notes, sealing them in bottles and throwing the bottles in the Pacific ocean to see how far they would float.

What's the record for floating bottles?

Hot flights! If supersonic transports go into regular service—say 400 of them flying four flights daily—they will raise the average surface temperature of the earth, according to a University of California professor. The heavy burning of fuels is the cause, he says. How much hotter will we be? Oh, about four-tenths of a degree.



Learn how Siding made of Reynolds Aluminum practically pays for itself...

Aluminum Siding rewards you in leisure, in savings, in beauty. Baked-on color saves so much on painting alone that it *practically pays for itself!* In addition, you save on repairs—because this siding can never rust, warp or rot. Get the facts on this important investment that comes back to you in savings and adds substantially to the value of your home.

Reynolds Metals Company does not make siding, but does supply quality aluminum sheet to the leading Siding Manufacturers. The "Mark of Quality" seal shown below identifies these manufacturers and their dealers in the Yellow Pages. The emblem appears on many brands of finished siding. Look for it as a "Mark of Quality" in the basic material—Reynolds Aluminum.



SEND COUPON FOR THIS FREE "FACTS" BOOKLET
 Reynolds Metals Co., Dept. PM9A, Richmond, Va. 23218
 I am a homeowner interested in the facts about Aluminum Siding. Please send me your Free "FACTS" Booklet.

Name _____

Address _____

City _____ State _____ Zip _____

Phone _____

See 'Jeep' vehicles in action on "World Series of Golf," September 10-11, NBC-TV Network.



Go 'Jeep' V-6

(It's really fun!)



Throw it in gear. And take off! It's really fun for the whole family. There's new V-6 power pulling for you, 160 horses strong. You'll think you've got wings—that's why we call it the Flying 'Jeep' Universal! With that solid build 'Jeep' vehicles are famous for, you ride relaxed—with assurance. 'Jeep' 4-wheel drive helps you stay safely in control when rain, ice, or snow make driving treacherous. That same extra

traction gets you into the back country, where it's rough and rugged. Choose the jaunty 'Jeep' Tuxedo Park Mark IV (shown), or the familiar 'Universal'. Both with V-6 engine or world-famous 'Hurricane' 4...bucket seats...81" or 101" wheelbases...tops, colors galore...special equipment. You've got to drive it to believe it! See your 'Jeep' dealer. Check the Yellow Pages. **KAISER JEEP CORPORATION**

TOLEDO 1, OHIO

The Flying 'Jeep' Universal

with 4-wheel drive

'Confessions' of a car salesman

Double-talk, model-confusion, accessory pricing are all in the can of worms used by sharp showroom peddlers to catch car-buying fish, but it's a two-way street, says this reporter who sold cars to find out

By RONALD G. SHAFER*



OCCASIONALLY A "BAREFOOTED PILGRIM", as the trade calls him, walks in prepared to pay the "sticker price" for a car

WE CAN PUT YOU IN A NEW CAPRICE with all the equipment you want for only \$2846."

The offer came from Big John, a husky Chevrolet salesman, after several minutes of pencil scribbling and adding-machine calculating.

The prospective buyer reached into his pocket and whipped out a handwritten list of dealer wholesale prices.

"That's too much. I figure this car cost you only \$2643," he said to the dumbfounded salesman. "We'll concede you \$100 profit, not \$200, and maybe we can beat that at another dealer."

**Ronald G. Shafer recently spent two weeks as an automobile salesman in a large city. This account of his experience is condensed from the Wall Street Journal, for which he is a staff reporter.*

The Wall Street Journal (June 13, 1966). © 1966 Dow Jones & Company

'Confessions' of a car salesman

Such a scene increasingly is taking place at the nation's 33,000 new-car dealerships. And to most auto buyers, the "heavy" in the drama is the car salesman.

But there's another side to the story: I saw it by spending two weeks recently at a Chevrolet dealership in a major city. Like the typical auto salesman, I put in 50 to 68 hours a week, sat in on deals and listened patiently to the questioning, haggling and two-fisted horse trading of today's car buyers.

It was an eye-opening experience, leaving these impressions:

For one thing, it's much more of a buyer's market than most people think. Even before the recent auto sales decline, which has aggravated the salesman's problem, car shoppers seemed to have the upper hand. Reason: Most are repeat customers, many of them veterans of "deals" they later regretted; now they are more knowledgeable, partly because of "how-to-buy" articles and booklets available at newsstands that provide, among other things, wholesale price lists.

Second, I discovered that today's customer often will order, say, a \$300 air-conditioner without haggling. But a total car price that is maybe only \$10 above what he had in mind can kill the whole transaction. And the more affluent the buyer, the tougher he usually bargains.

Third, despite all the talk about auto safety, I observed surprisingly little con-



WITH A "MOOCH" the battle is short. One grizzled buyer offered cash for a take-it-or-leave-it price

cern on the part of serious shoppers. In fact, most of the safety-related questions I heard were about tires, not the car. Of the few shoppers who did raise safety questions, none appeared to consider it an important factor in deciding whether to buy.

There was more showroom talk about financing. The salesmen tried hard to get customers to buy on credit, even if they could afford to pay cash. This is because credit provides a key source of a salesman's profit. He can increase his profit on a sale by as much as 40 percent by persuading a customer to finance his purchase through the dealership, rather than paying cash.

I learned too that auto salesmen have more flexibility than is readily apparent. Though the sales manager must approve a "close" deal, the salesman often has up to an \$800 trading margin between dealer cost and the factory suggested price of a car. In a sense, the salesman conducts an auction, getting the best deal he can.

Finally, I came away with a fresh sympathy for the car buyer. "The buyer can get so caught up in price and models and bounced around from dealer to dealer with figures, misquotes and double-talk



THE PROSPECTIVE BUYER whipped out a list of wholesale prices and conceded the dealer a \$100 profit

that he doesn't know what he's doing," a soft-spoken salesman of 42 admits.

How do buyers choose a car today? The majority of our customers had their minds made up on Chevrolet when they walked into our showroom. We didn't compete with Ford or Plymouth, but with the other Chevy dealers in our area. As one salesman put it, the buyers parade from dealer to dealer "like Armenian rug peddlers," collecting competitive prices at each stop.

When a customer walks into a dealership, the scene unfolds something like this: The nearest salesman quickly descends upon the visitor and "takes his temperature." That is, through seemingly normal conversation, he finds out if the prospect is a buyer or a "mooch" (a price shopper); whether he plans to pay cash or will finance, and if he has a trade-in.

Once the salesman has thus sized up his prospect, and given him a chance to look at the showroom cars, the action moves to his office—a partially glass-enclosed cubbyhole at the side of the display floor. Now the battle begins.

With a "mooch," the battle is usually short. "Just tell me how much this Corvette will cost. Don't give me any of that stuff about service—price is everything to me, and I have more stops to make," ordered a doctor, shopping for a \$5000 car for his son.

One burly, unshaven man in his forties, who stopped by for his third haggling session with Bob, our top salesman, said: "What's your price on this Impala? I'm



IT'S EASY TO SELL A WOMAN—somewhere along the line make sure to compliment her. It never fails

going to pay cash if we can get together."

"Well, we have a contest on right now, so I can deal closer than usual. I'll sell you the car with this equipment for only \$2552, plus \$200 for your old clunker," replied Bob.

"I've got you beat by \$20."

"With this equipment? I can't believe it. And remember we can give you immediate delivery," said Bob.

"Hmm. Wait a minute," the customer said. "I'm not sure about those tires. What will it cost me to get heavier ones?"

"Let's see. I can give you those at our cost, only \$44 extra. And if you let me write up your order tonight, I'll drop my price to \$2525 plus the \$44."

"Tell you what," countered the buyer, pounding his fist on Bob's desk. "Take off \$10 and you got a deal. Take it or leave it."

"You mean you were ready to pay \$2515 in cash and you'd walk out for \$10?"

"\$10 or \$10,000. It don't make no difference. Want my deal?"

"You drive a hard bargain. But I'll take it," conceded Bob, after a thoughtful stare at the ceiling.

Actually, Bob wasn't quite as upset as

(Please turn to page 216)



"SCHLOCK DEALERS" still open their doors each day looking for buyers they can take. But they are fading

Just point 'er in and

No matter how tight the squeeze, this amazing new

IT PROMISES to end the fender-bashing technique of parking by ear and make it easier to park a Caddy than a Mini. It is the "Sidler," which will be shown for the first time in the United States at the Inventors Show, N.Y. Coliseum, September 9 through 18. Basically,

what Sidler does is allow the rear end of an automobile to be driven sideways in to the curb while the front wheels remain stationary.

Invented by Archie Butterworth, British engineer and former racing driver, the "Sidler" really negotiates a tight squeeze



THE "IMPOSSIBLE" IN CAR PARKING is not only possible but downright easy when car is equipped with a "Sidler." Nose into a parking space, pull a knob and—presto!—the car's rear end rises and swings over to curb



SIDWAYS PARKING depends on fluted wheel-driven rollers which press against inner side of rear tires and act as bevel gears. Rollers turn driving direction 90 degrees. Low gear swings rear to left; reverse, to right

push the button By M. J. PEDERSEN

car 'Sidler' will swing your tail in snug against the curb

like a shoehorn, reports Mike Priestley, PM's correspondent in Britain.

Priestley watched a demonstration of the device, and gave this explanation of how it works:

All you do is nose the car's front end into a parking space scarcely bigger than

the car's length. Pulling a control knob activates two hydraulic rams which are powered by a small engine-driven pump. The rams lower two specially shaped rollers whose two main features are a fluted outer rim and an annular polyurethane tread. When the treads touch the ground, the force applied by the rams jacks the automobile's rear wheels slightly clear of the road.

At the same time, the fluted outer rims of the twin rollers engage the tires, acting as bevel gears. They are driven by the rear tires which, as usual, are powered by the car's engine. Shifting into reverse gear swings the rear to the right; low gear, to the left.

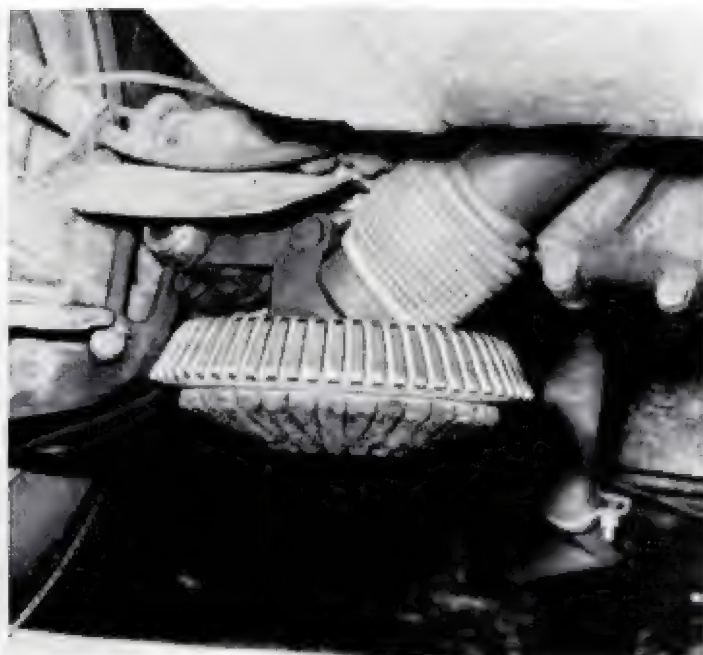
After entering or leaving a parking space, the control knob is reset in its "off" position, and the whole apparatus—rams and rollers—retracts.

Though the pictures show the Sidler bolted to the rear axle, a later design locates it forward of the rear axle, attached to the underside of the body—in order to hold unsprung weight to a minimum.

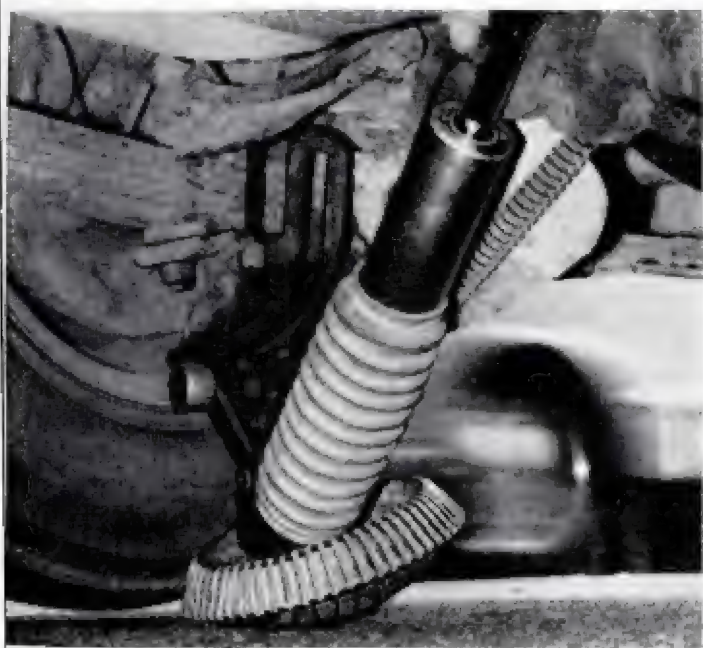
For front-wheel-drive vehicles, from Minis to heavy semi-trailer trucks, Butterworth has designed a modified version of the Sidler unit, utilizing small retractable road wheels instead of rollers and involving a slightly different parking technique. Now, instead of driving the front end all the way in to the curb, the driver stops two or three feet short of the vehicle in front, engages the Sidler (which raises the back end as before), and then drives forward again. This last movement swings the rear end in to the curb.

Butterworth sees his invention as an invaluable urban driving aid, technically and commercially viable, and virtually maintenance-free. He claims there is no measurable wear either on the tires or the fluted aluminum outer rims. The only part that might need to be replaced is the polyurethane tread, which could be exchanged for an inexpensive retreaded one.

On a limited production run, Sidler would sell for about \$200. In quantity would price it around \$140—placing it in the optional-equipment market. ★ ★ ★



FLUTED ROLLER engages each rear wheel. Left roller is shown in retracted position, bolted to rear axle



HYDRAULIC RAMS lower beveled rollers, jacking rear wheels off ground to enable sideways drive to curb

New Tools for Surgery: Searing Heat and Deep Frost

Probes cooled to minus 300° F. are knocking out tumors and diseased brain cells. White-hot laser beams are "cooking" cancers and "welding" damaged retinas. And now medicine looks to the plasma arc—which burns hotter than the sun—as a superscalpel

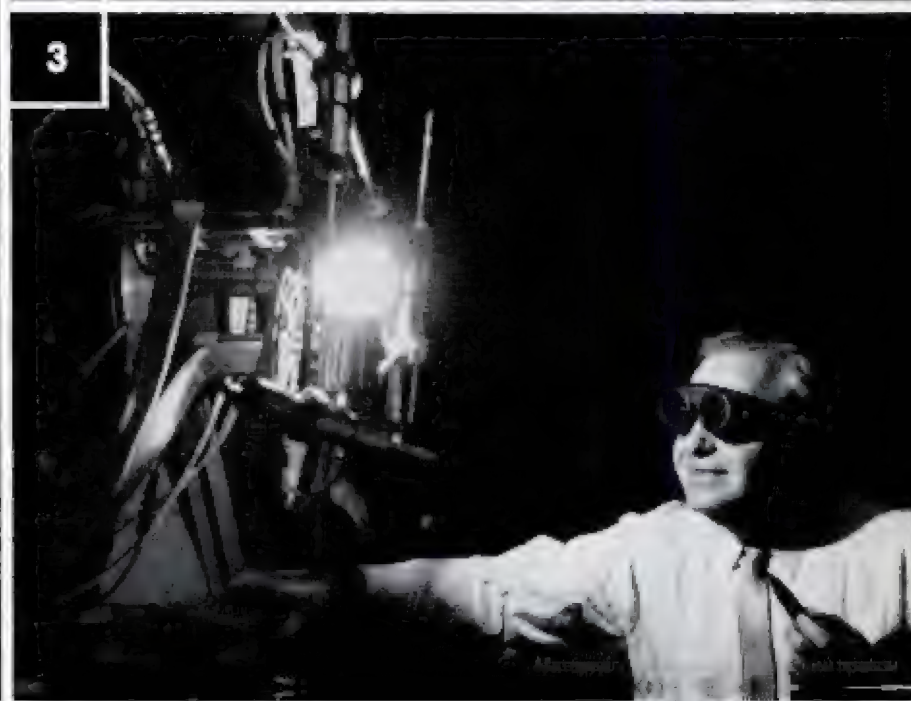
By James R. Berry

TUMOR IS TURNED into an ice ball in operation shown above. Cryoprobe in surgeon's hand can solidify tissues at temperatures as low as minus 300° F.



TWO of man's traditional foes—extreme heat and extreme cold—are fast becoming important friends. Medical researchers are learning how to tame temperatures colder than the dark side of outermost planets and hotter than the sun's surface. And, although the therapeutic use of heat and cold has only recently begun to be seriously explored, some amazing results have been achieved. Dozens of new operations, treatments and medical devices based on either low or high temperatures are now used for man's welfare. Other developments, equally impressive, are nearing perfection.

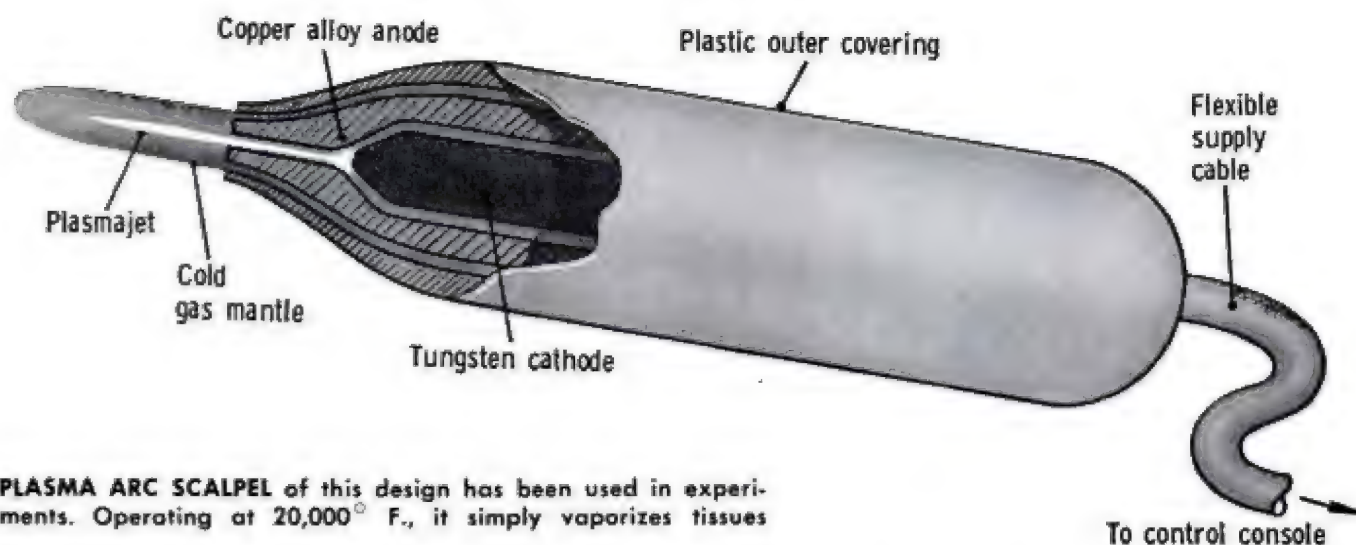
Take the plasma arc scalpel, for example. Since man's first crude operations with a stone knife, bleeding has been a major surgical problem. "Today, surgeons spend up to 85 percent of their time keeping a patient from bleeding to death," says Dr. Robert Shaw, staff surgeon at San Francisco's Presbyterian Medical Center. The difficulty is especially severe with blood-rich organs like the liver, pancreas and spleen. Often, age or disease has so



1. CRYOPROBE has proved especially useful in removal of cataracts. Unlike conventional instruments, the probe does little damage to the eye's lens membrane

2. WHILE SURGICAL TEAM concentrates on the patient, instrument atop pedestal automatically monitors the temperatures of the probe and the tissue around it

3. HOTTER THAN SUN'S SURFACE, plasma jet was a laboratory phenomenon with a lot of potential. Now scientists are developing it as a superscalpel



weakened a patient that his doctors won't risk prolonged hemorrhage, even though surgery might extend life.

A solution to this problem now seems near—and it does away with the traditional knife. Dr. Shaw, along with Columbia University physicist Dr. Charles Sheer, is perfecting a scalpel that cuts with a searing jet of plasma—a gas so furiously hot that electrons are ripped loose from its atoms.

Work on the plasma scalpel began a few years ago when the two researchers thought of using a miniature blowtorch to cut tissue, which is roughly 80 percent water. A thin flame, they reasoned, would vaporize the water, disintegrate the solid matter, and cauterize the two sides of the incision. Though the idea was sound, it didn't work.

For one thing, some of the gases they used for fuel proved toxic to tissue. When Sheer and Shaw used a nontoxic fuel, oxyhydrogen, the flame cut too wide a line and charred healthy tissue. In addition, the tiny flame front cooled slightly on touching the skin, didn't vaporize solid matter quickly or evenly enough.

Then the two men thought of another fuel: plasma, the hottest stuff found in the universe. Its advantages:

- Heat isn't developed by chemical combustion, but by exciting a gas until the electrons strip from their nuclei. Since a chemically inert gas such as argon or helium can be used, there's no chance of contaminating an incision.

- Even a small generator can create plasma with a temperature of 20,000° F.—twice as hot as the sun's surface and hot enough to vaporize living tissues instantaneously.

- Plasma acts like a gas and can flow

at high speeds. Vaporized matter is swept away by the plasma stream so quickly that heat isn't conducted to tissues beyond the incision. The cut is cauterized, but nearby tissue isn't charred.

At the time the research team hit on the idea, the smallest plasma generator available weighed four pounds, hardly an instrument for delicate surgery. With a grant from the John A. Hartford Foundation, the two men began work on a smaller model, Dr. Sheer taking over the engineering end and Dr. Shaw handling the medical aspects.

The result resembles a ballpoint pen. Inside, a copper alloy element surrounds a tapering core of tungsten. A narrow space between the two metals serves as a channel for the gas, which exits at the narrow end. An electric current through the two metals sparks an electric arc near the instrument's pointed tip. As the gas passes through this arc, it's transformed into plasma. To prevent the tip from melting, a jet of cool gas passes through separate channels and sprays over the nozzle. As a bonus, this gas exits from the tip and surrounds the needle point of plasma with a cool mantle, helping to arrest charring.

In operations on animals, the plasma scalpel has performed perfectly, making bloodless incisions no wider than a pencil line. Right now, Sheer and Shaw are perfecting the instrument's design.

Another of science's hottest gadgets is the laser, which produces an intense, crystalline-pure beam of coherent light.

(Please turn to page 224)

ZAP! LASER BEAM flashes into a tumor on hamster (right) in test at Boston hospital. Quick burst of energy causes many tumors to disappear within month





500 eggs in one basket

A revolutionary new era in air travel is only three years away. Then the first of the jumbo jets — with more than twice the capacity of present planes — will go into service. And even bigger “flying hotels” are in the works!

By THOMAS E. STIMSON

THEY'RE CALLING IT the “Boeing Hilton,” unofficially, because this enormous, new airliner will be able to carry 490 people, the capacity of a good-sized hotel.

There's room on board for private state-rooms plus a big lounge up forward. “Economy” seats will be large and luxurious. If an airline desires, the builder will

install a separate motion picture area and even a special playroom for children!

And here's the big surprise: Other builders are saying that Boeing's jumbo jets *aren't large enough!* Douglas is thinking about a 550-passenger DC-10 and Lockheed is talking about a gigantic L-500 that could carry from 750 to 900 passengers. Lockheed says its plane could fly





TO SPEED BOARDING, 490-passenger Boeing will require four waiting rooms, each with entrance to airliner. Speedy conveyors will carry aboard all baggage



SEATING CONFIGURATION for Boeing 747 calls for 9 or 10 abreast, but individual seats will be 10 percent wider than those currently used in the "economy" class



CONTAINERIZED CARGO in 10-foot-long boxes will roll on at rate of 100 tons—plane's capacity—in under 10 minutes. There will be both nose and side loading



HELICOPTER, MISSILE, TANK, JEEPS—typical cargo is shown aboard model of Lockheed C-5A. In commercial version, this plane could carry 750 to 900 passengers

you coast to coast for the price of a bus ticket, and make a profit. Or carry cargo at truck rates.

Pan American has ordered 23 of the new Boeing 747 airliners, plus a couple of cargo craft, and will put them into service beginning in three years.

In spite of their great size and weight, the new airliners will climb out faster than

the present jet transports. They will operate from existing runways. They will be able to fly higher, yet will be so sturdy that the present emergency oxygen systems for passengers may not be required.

They will be completely self-contained, with their own auxiliary powerplants to handle electrical requirements while on

(Please turn to page 192)

LILLIPUTIAN GOLF SET has a power driver that shoots the miniature ball variable distances up to 125 feet and requires skill and technique similar to its full-size counterpart. (Further details on this hobby-sport appear on page 77)



BETTER MOUSETRAPS

Here are just a few of the gadgets, the gimmicks, the far-out ideas that'll be unveiled at the International Inventors Show this month

By M. J. PEDERSEN
PM's Inventions Editor

THIS MONTH America will be hit by the grandest, most eye-boggling group of UFOs ever to set down in one place at one time. Ranging from the kooky to the brilliant, they are all UFO—that is, Unbelievably Fantastic Objects—and all will be on display at the New York Coliseum from Sept. 9 through 18.

Gawkers will behold a stepladder that contorts itself every which way; a parking garage that spews forth cars with nary a human touch; an aural recorder that records onto paper instead of tape; a water-sensitive alarm for use on a bed-wetter's mattress. There's a submarine that flies, a car that braves the water, and a car that parks sideways (page 62). Other items appear on following pages.

In short, from the looks of things at the *2nd International Inventors and New Products Exhibition* there's scarcely a material human need not considered.

Along with this fantasia of inventions is a flurry of activity that somehow fuses the fun-and-games atmosphere of a carnival to the wheeling-and-dealing element of an Arab bazaar. Like carnival masters, inventors delight gaping spectators with their "routines"—contrary to the usual image of an inventor as a man long on thought and short on talk. Though this may be the case in lab or by workbench, once he's taken up "residence" in the exhibition hall, he's transformed into a topnotch performer who avidly demonstrates the marvels of his brainchild.

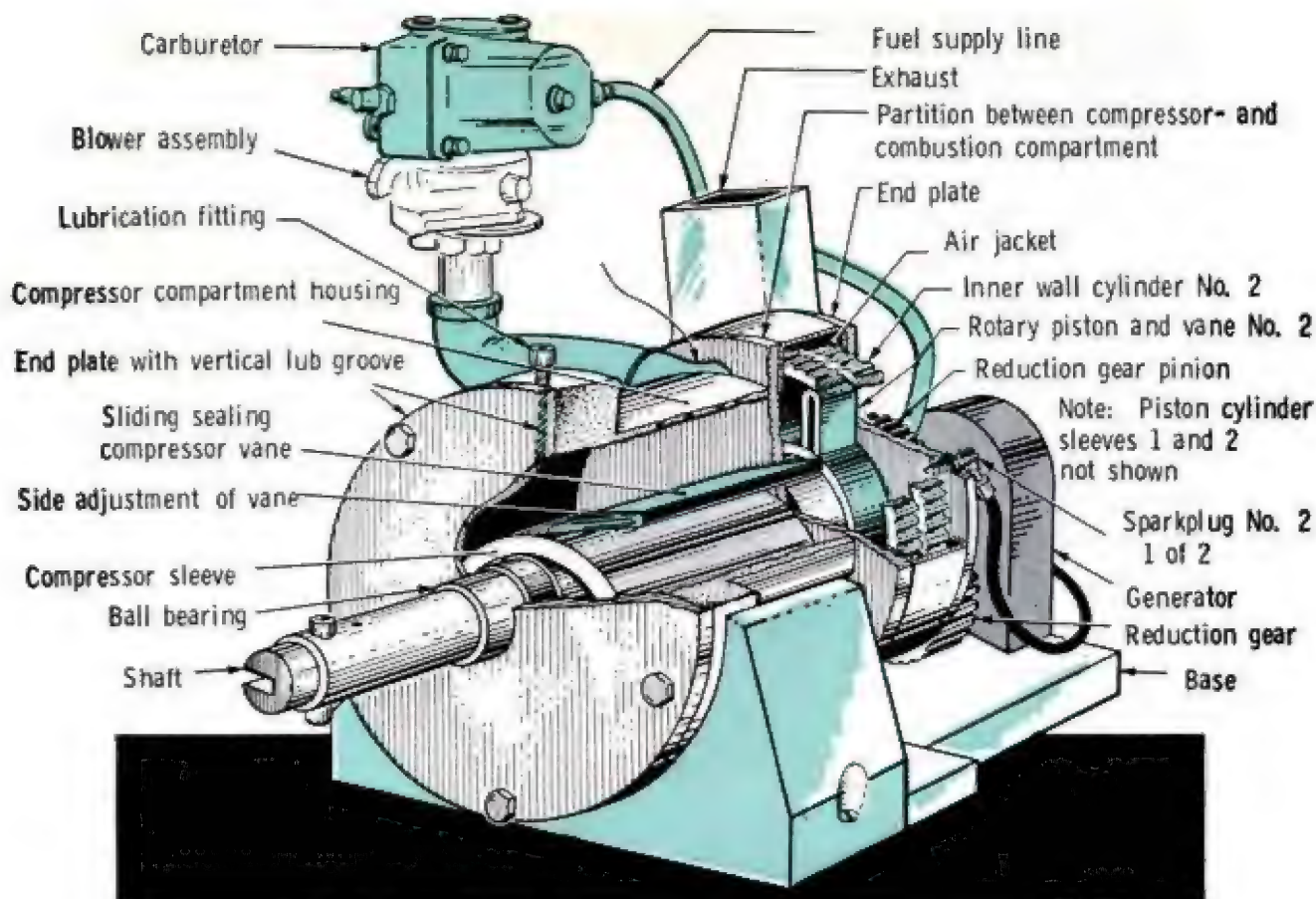
Shooting for high stakes

Such enthusiasm grows out of countless hours of previous solitary toil. In fact, many ideas were spawned in the weirdest circumstances. One inventor, Tom Bergstrom, had the inventive process thrust upon him when an automobile accident laid him up for a year and a half. "Being bedridden for so long forces you to think," he says. His thinking during convalescence resulted in the beautifully hand-tooled Lilliputian golf set (opposite page).

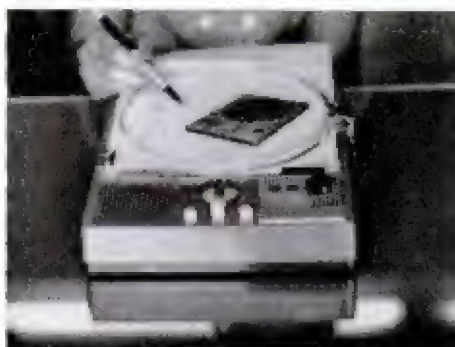
However, for all its holiday spirit, the crux of the show turns on serious business with high stakes. Obtaining a patent is one thing—it costs money. But for most of the hopeful inventors here, it's only one step in long-range plans which frequently boast a million-dollar flag at the goal. Hoping to be seen by the "right" people, they've plunked down \$180 for an exhibition booth for the 10 days.

The need, on the part of the inventor, for monied people to see his patent into production, coupled with the need of manufacturers for new products and ideas, is the *raison d'être* of the *2nd International*. It provides a forum for the bidding and dickering necessary to financial agreements—and perhaps some unfulfilled, high-sounding promises and false hopes as well. In any case, the exhibition will bring together inventors and manufacturers from all corners of the world.

Sponsoring and organizing the show is a firm called Patent Exhibits, Inc. (554 Fifth Ave., New York City), which is also active in European exhibition circuits. And representatives from foreign inventors' associations—as well as from the U. S. Patent Office and the Small Business Administration—will be on hand to answer inventors' and spectators' questions.

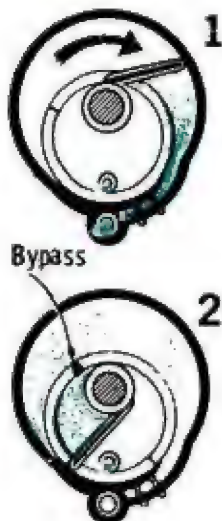


Another pistonless engine joins the celebrated Wankel as a means of powering vehicles. Not as powerful as the German-made machine, this new rotary internal-combustion engine will produce up to about 30 hp and will be useful for motorcycles or very small compact automobiles. Chief features of the unusual design, patented by Jaime Udelman of Venezuela, are a compression chamber with an adjustable sweep blade or vane that rotates both inside and outside a rotating cylinder, and two separate combustion chambers that operate in opposite sequence to each other. While one is firing, the other is cooling off. Unlike the Wankel, the Udelman is air-cooled and burns a mixture of air and naphtha. Also, it is light weight and apparently easy to manufacture. The compression and combustion sequences are shown on the opposite page, starting with compression of air and fuel through burning.



Recording sound on paper (which may then be written on and stuffed in an envelope like a letter) is possible with a transistorized machine called Nakavision. Nakapaper, the magnetic recording sheet, may be used time and again on both sides, notes Yoshiro Nakamatsu, Tokyo. Left, girl ready to record, microphone in hand, Nakapaper on turntable. Erasures of sound are made by sweeping the erasing unit over the paper's surface (upper right). Its graphic message unimpaired, Nakapaper is ready for reuse (lower right).

Compression



1. Compression chamber contains unusual blower-vane assembly. At top of sweep, vane protrudes almost entirely through slot in rotating cylinder, compressing air-fuel mixture and forcing it into commuting line at bottom of housing where it goes to combustion chambers. Meanwhile, fuel is injected into cylinder for next sequence.

2. As vane sweeps through bottom of sequence, it retreats almost entirely inside cylinder, forcing new air-fuel mixture through bypass holes into outer chamber for next go around. Vane rotates on center shaft; cylinder rotates freely in grooves at both ends of the chamber.

3. Two combustion chambers are identical, but ignite on alternating revolutions. While sequence (1) is occurring, one combustion chamber is in this phase, with vane almost entirely inside its cylindrical sleeve. Compressed air-fuel mixture from commuting line enters and

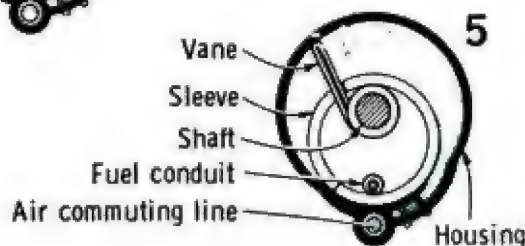
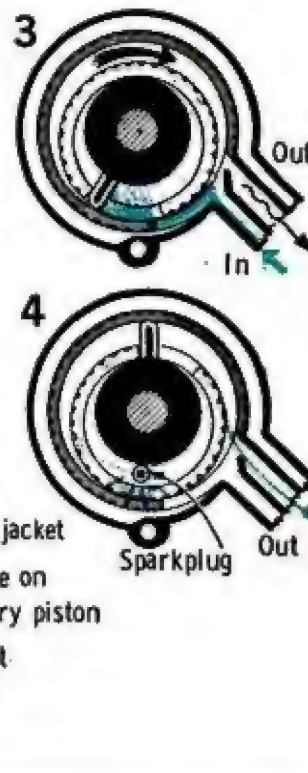
fills area between cylinder sleeve and rotating piston.

4. Fuel-air mixture is compressed even more inside sleeve and, at this position, corresponding to (2), sparkplug ignites, burning mixture and producing power for entire sequence. Second combustion chamber, meanwhile, has been getting flush-out with cold air during cycle.

5. Sequence starts again in compression chamber with new fuel-air mixture that was forced through bypass holes. Vane has slipped through slot in sleeve to begin compressing it again, maintaining pressure-tight seal throughout.

6. As second combustion chamber begins firing cycle, first chamber closes its exhaust and gets flush-out with air mixture, cooling chamber. Ridges on outer sleeve and air jacket surfaces merely increase area for quicker cooling.

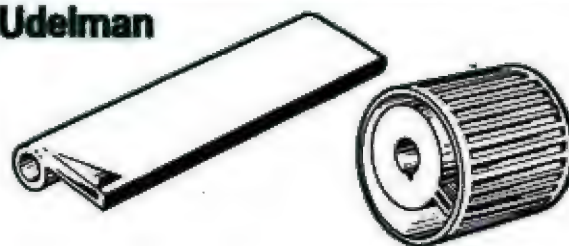
Combustion



Wankel

Differences and advantages between Wankel and Udelman engines are that Wankel is liquid-cooled, burns gasoline or other fuels and can go to larger horsepower

Udelman

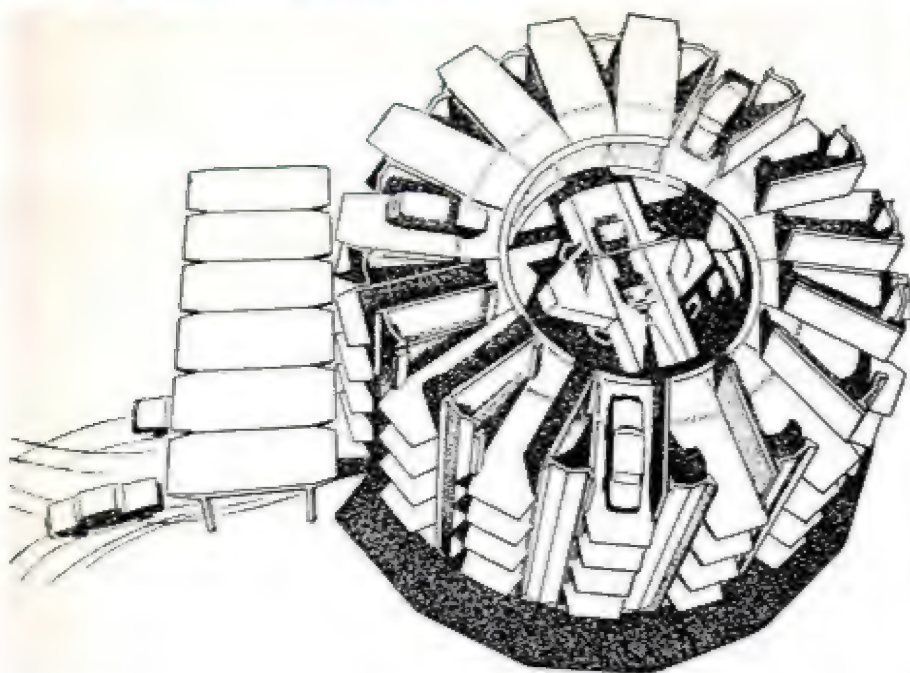


New Udelman engine is air-cooled, uses separate chambers for compression and combustion, is limited in horsepower but inexpensive to make, and burns naphtha



Eight shots per loading may be fired from this studgun with a one-eighth turn of the cylinder after each firing. Used for steel and concrete, the gun is loaded by removing the cylinder pin and disengaging the cylinder (left). After the projectiles have been inserted, the cylinder is put back in its housing and secured by reinserting the cylinder pin. In order to fire, the gun must be pressed firmly against the work surface (right). To eject the empty shells, the cylinder is once again disengaged. Driving the pin through the center of the cylinder from front to back forces all the shells out at once. M. Thomas, St. Etienne, France, notes that the studgun is automatically uncocked the moment it's removed from the work surface.

7000 better mousetraps



Put a nickel in the slot—or a charge-plate—and like peanuts from a vending machine, out pops your car from this self-service garage. Parking is just as automatic. Once the credit card registers, the car moves, via a rolling platform, onto an elevator in the center, which “feels” for the nearest vacant slot. When one has been detected, the elevator rises and rotates until it is in position to deposit its load. Cars signaled for withdrawal can be picked up on the same trip. The same principle that enables direct contact between the circular lift and parking spaces underlies automatic shelf-stacking systems of many European grocery stores. By C. Hagel, Germany.

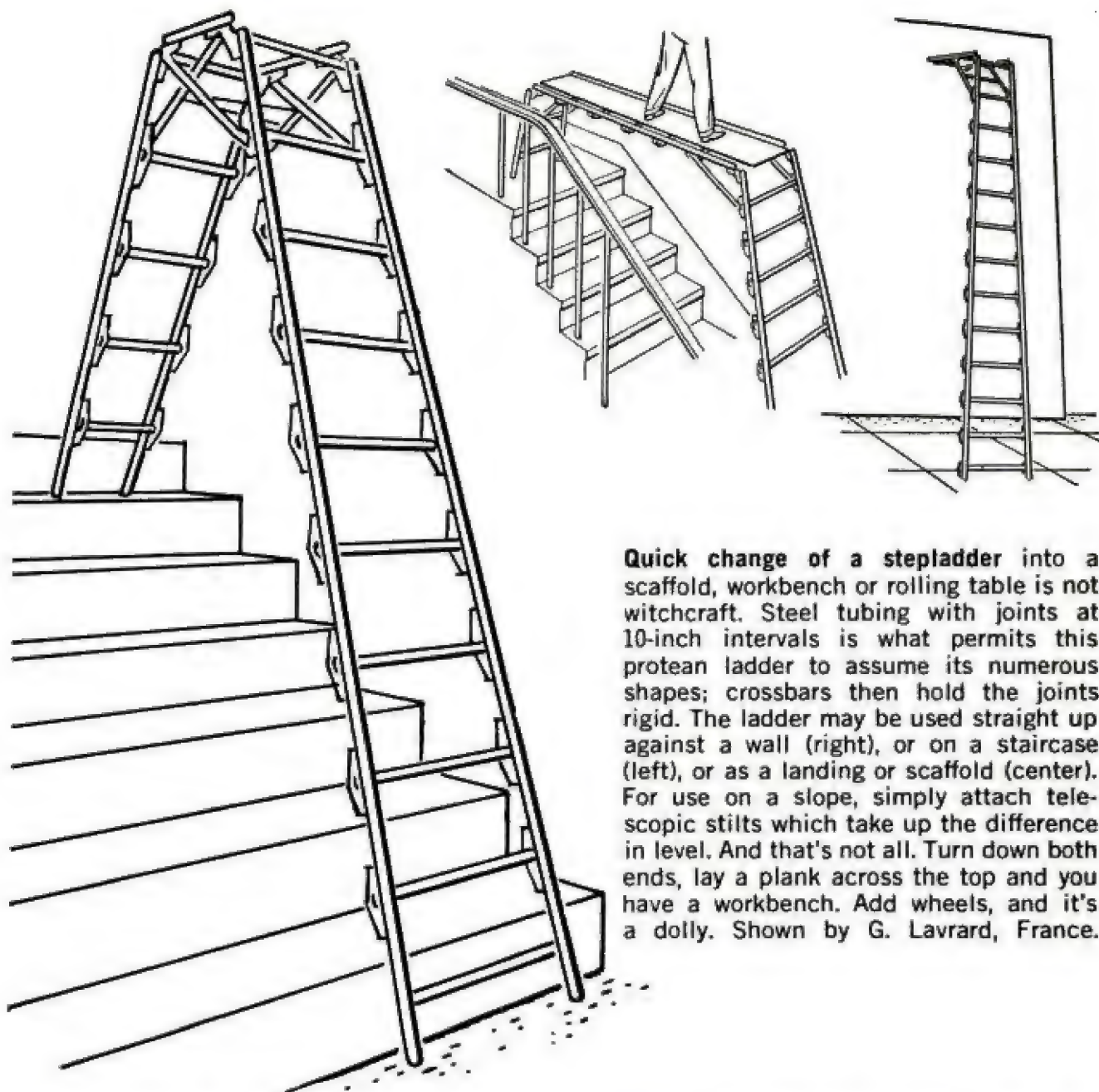
Peeping Toms will have their view severely hampered by a window shade made of wooden slats that works several wonders. It will unfold from the bottom and up—to provide cafe-curtain privacy—or the slats may be spaced to allow shafts of light through. By means of a counter-balancing arrangement in the cords, the shade retains any position at the push or pull of the slats. Inventor: Garnett Abraham, New York.



You can drive a car to water—then drive it on water. A twin-pontoon trailer provides the means of flotation and the car engine, the power. A system of universal joints enables John Brush, Cincinnati, to hook up the car's transmission to the propeller. The 13-foot catamaran shrinks to a 74-inch width for highway travel.



Not a flying saucer, but a saucer-shaped boat which skims the waves with either sail or power or both. Its radical design incorporates a sail that stretches between two masts and three swivel center boards used for steering, notes D. H. Sharp, Strathmore, Que.



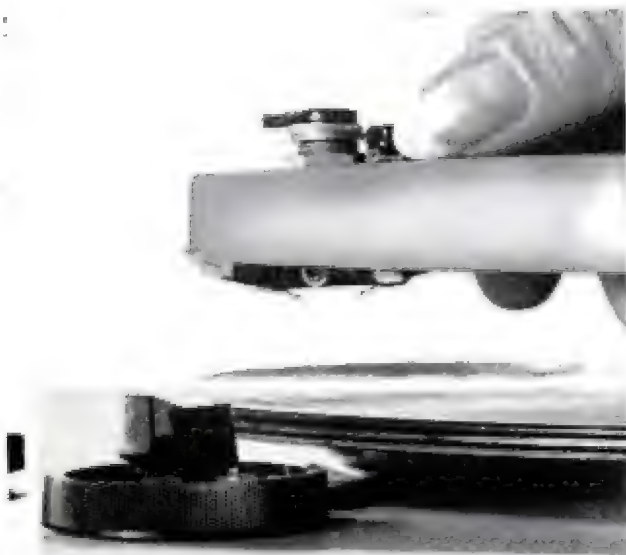
Quick change of a stepladder into a scaffold, workbench or rolling table is not witchcraft. Steel tubing with joints at 10-inch intervals is what permits this protean ladder to assume its numerous shapes; crossbars then hold the joints rigid. The ladder may be used straight up against a wall (right), or on a staircase (left), or as a landing or scaffold (center). For use on a slope, simply attach telescopic stilts which take up the difference in level. And that's not all. Turn down both ends, lay a plank across the top and you have a workbench. Add wheels, and it's a dolly. Shown by G. Lavrard, France.



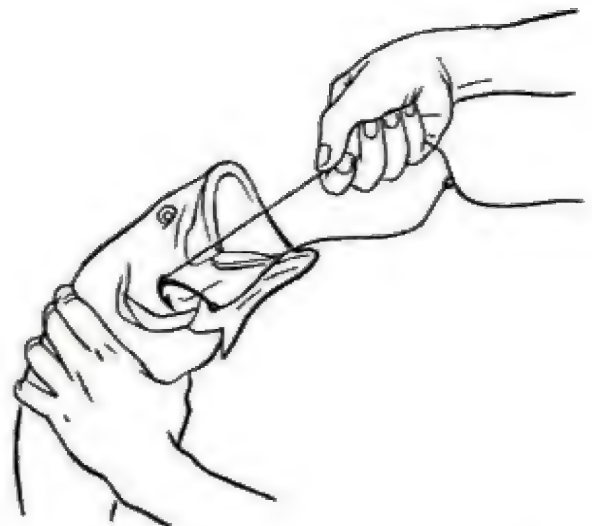
Hard times would soon hit pickpockets if enough men wore this belt billfold. Threaded onto a man's belt, it has a safety compartment which flaps over the belt to hide two separate inserts for large bills and important cards. The exposed zippered section is for small bills. Howard A. Kehl, Detroit, is the inventor.



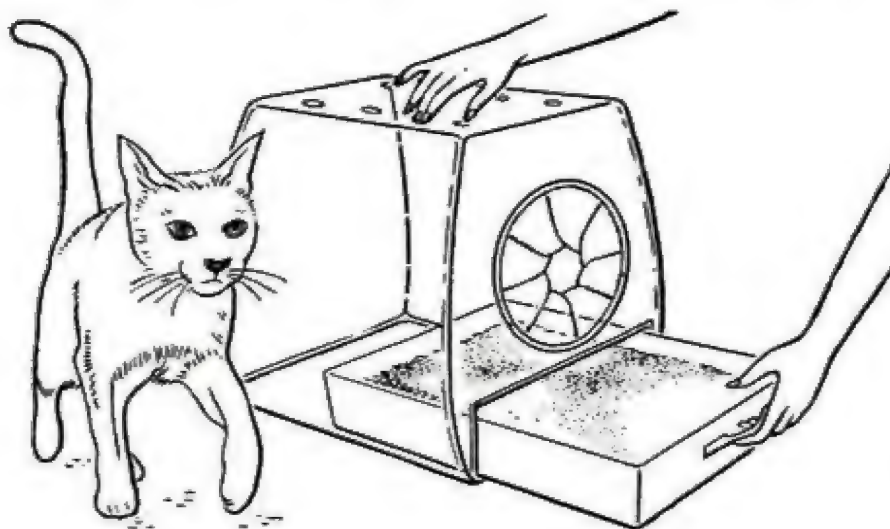
Your car won't budge with this Sta-Put wheel chock. As explained by the inventor, Michael Vigilante, Massapequa Park, N.Y., the secret's in the legs. The forward force from the weight of the vehicle is transferred to the wheels and converted into downward pressure, locking the chock to the ground on any surface.



Mono sounds like stereo when played on this two-needle cartridge head. Or if it's used in a stereo setup, it produces a still richer tone, according to the inventor, Enrico E. Pennucci, New York. Since both needles trace the same groove, there is a split-second time lag in pickup which causes a slight overlapping or blending of the sounds.



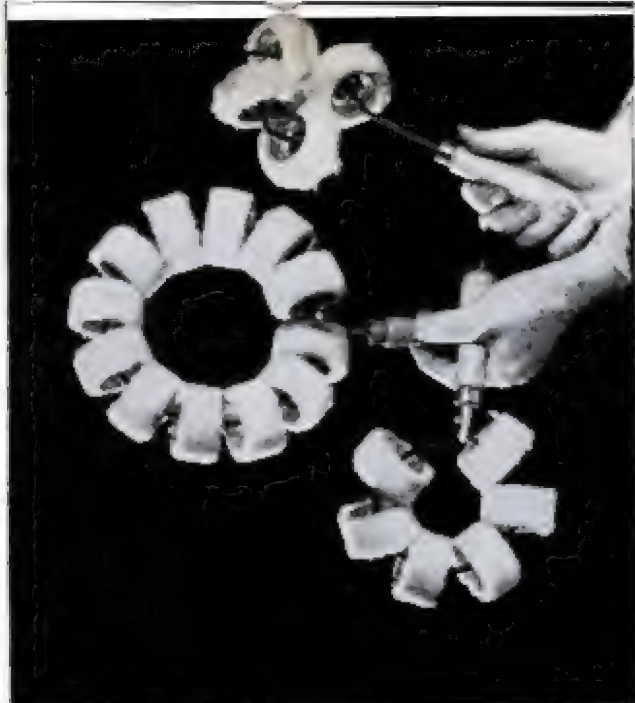
Extracting a fishhook with finesse is nearly impossible if the hook is swallowed by the fish or otherwise deeply embedded in flesh. Earl Buttemeier, Chicago, offers a solution by attaching an auxiliary line to the bight of the hook, as in the drawing above. A tug at the auxiliary line swings the hook around so it may be pulled out, bight first, the same way it went in.



Clean as a whistle is kitty's corner with this enclosed cat commode which keeps litter in the box—not on the floor. Made of clear plastic, it has a removable tray for easy disposal of the litter. Kitty gets in and out by pushing through the flexible plastic tongues of the porthole. All this plus finger-size air holes to make it easy to carry. Eleanora Walker of New York is the person responsible for this latest word in modern living for hep cats.



Golfers and non-golfers will find sport in flexing their finger muscles in this finely tooled miniature of an old favorite. Inventor Tom Bergstrom notes that its utilization of such techniques as slicing and hooking makes it good practice for big-league playing. Long drives are delivered by a spring-action power driver; short strokes (left) use a finger-tip "chip-'n-putt." May be played table-top style, or on lawn or basement floor.



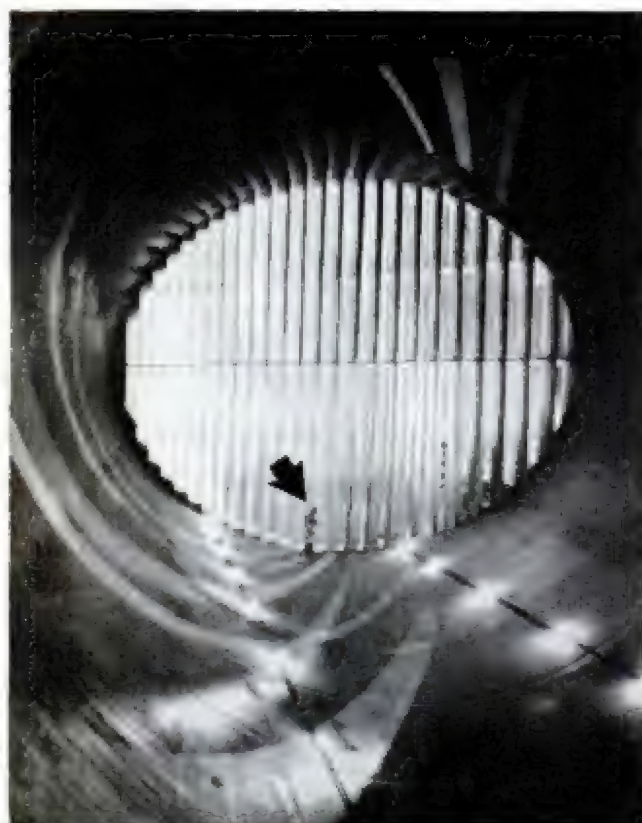
All-embracing paintbrushes combine up to four strokes in one, thus speeding up the painting of poles, posts and railings. George Schleicher, New York, has used high-carbon steel spring wire for the axles of all his prototypes. A lamb's-wool fabric was used for the rollers—short nap for thick, tarry paint; long nap for regular consistency. Both square and round designs come in different sizes. A wider brush can be made to cover a slightly smaller rod by holding it at an angle. The square brush paints round as well as square bars; the round brush—columns, ranch-type fences, pipes. Schleicher sees pipes as providing the most lucrative market for his brushes; industrial contracts covering hundreds of miles of piping frequently run into six-figure costs.



Hard-hatted soft heads enjoy an extra measure of safety with a hidden, interchangeable helmet. Called Sport-Guard and made of Royal-ite, it slips underneath the sweat band of most of the hats. Swimmer's cap (foreground) and derby require permanent insertion. Not only sportsmen need a helmeted hat; Mario Plastino, New York, reports the N.Y.C. Police ordered several for their tactical force.



Floating landing mat, made of bonded aluminum sections with polyurethane cores, can be set up in marshes and rice paddies converting them into airfields for helicopters. The mats, which can support impact weights up to 26,000 pounds, have a two-year life expectancy.



High winds and extremes in temperatures for both aerodynamic and climatic automotive testing are made possible in this new wind tunnel at Volkswagen's Wolfsburg plant in West Germany. Largest of its type in Europe, the tunnel can test cars in 95-mph winds and in temperatures from minus 22° to 122°F. Big, hydraulically operated blades move up to 51,200 cubic feet of air per second. Man (arrow) is dwarfed in the huge tunnel.



Three-wing plane, replica of World War I Sopwith Scout, was built by an amateur builder in Illinois from original 1916 factory drawings and even has original Clerget rotary engine, propeller, cockpit instruments and Vickers machine gun. It is painted and marked to duplicate a Sopwith flown by Lt. Col. Raymond Collishaw, Canada's second leading ace, who had 60 victories. The plane is airworthy.



An inflatable hovercraft, built in Britain, is powered by a pair of small engines which blow it up like a vacuum-cleaner bag. The craft is being developed to carry seven men at speeds up to 35 mph. The machine has lifted itself over parked cars and people as well as the usual smooth surfaces, roads, grass and water.



Plastic viewing dome permits students at New York's Albert Einstein College of Medicine to watch operations. A two-way communications system allows surgeon to explain procedures and students to ask questions. By sealing off operating room, the bubble eliminates the contamination problems of the usual open amphitheater setups.



Emergency wheel positioned behind ordinary auto wheel and tire provides greater driver control in the event of a blowout, puncture, or similar "panic" situation, according to the device's French inventor. The tire is solid rubber and can bear weight of car for as many miles as necessary.



Steered by television and operated by a remote console, the Ryan Firebeetle was developed as a mobile gunnery target. Air crews or surface gunnery crews both may use it. The vehicle is built around a Corvair chassis and engine.

Whirring, clanking and wheezing, this automated kitchen is a gourmet gadgeteer's dream as meals made to order come off conveyor belts untouched by human hands

By CLIFFORD B. HICKS

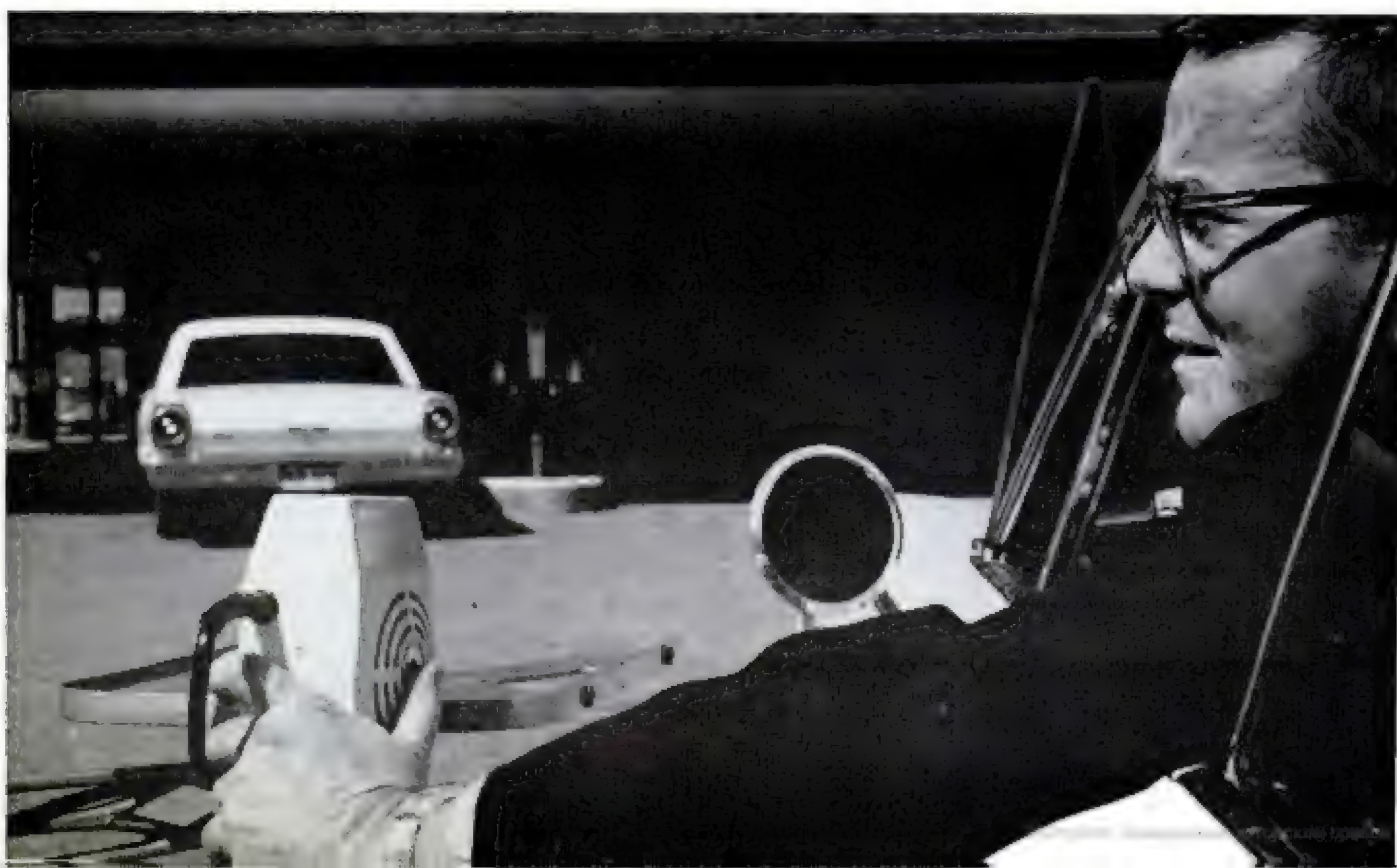
ORBIS IS A PRETTY LITTLE THING, although not the type you'd expect to find around a drive-in restaurant. Her hips are four feet wide, and she's just about the same height.

But despite her short stature, Orbis is absolute boss of a kitchen crew that can, within one hour, turn out 400 hamburgers and the same number of frankfurters; 360 orders of french fries; 175 platters of fried chicken, seafood or onion rings; and a torrent of milk shakes and carbonated drinks. And not a human hand does a lick of the work.

Orbis (for Order, Billing System) is a tidy little computer. She and her busy mechanical helpers were designed by American Machine & Foundry Co. to replace three specialists: the hamburger man, the short-order cook and the soda jerk.

The first AMFare installation is at Jay's Drive-In Restaurant in a tidy, modern eating place in Brooklyn Center, a large, sprawling suburb of Minneapolis. I traveled 400 miles to meet Orbis and

DOUBTFUL AUTHOR PUSHES BUTTON on speaker, which alerts computer operator that he is ready to order. Eighty percent of restaurant's food is prepared by machine





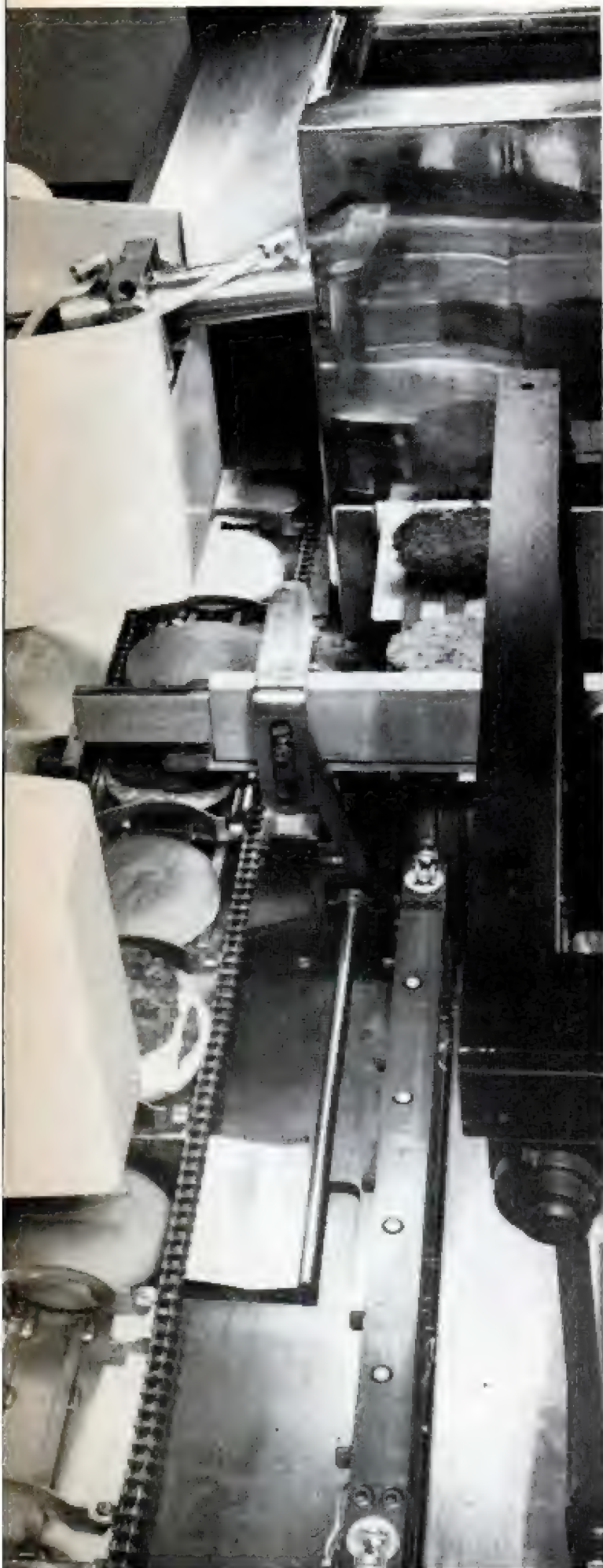
FOOD TUMBLES OUT of all the machines and marches on conveyor belts toward assembly man. He puts up orders in accordance with bills which have automatically been calculated and printed

ORBIS the computer (helped a bit by her operator) supervises the kitchen in lonely grandeur. As the customer dictates his order, operator pushes corresponding keys on Orbis. Orbis holds order in her memory system until it has been repeated to customer and acknowledged



After broiling . . .

the burgers are topped with sauce or cheese



prove that no machine can substitute for a human being over a hot stove—at least as far as preparing *my* food.

In this aggressive frame of mind I drove into one of the stalls at Jay's, and promptly found myself soothed by soft music from a speaker at my elbow. With a final sneer, I looked at the menu, displayed on a stand nearby, figuring I'd be lucky to be able to select from five items. There were 38 selections.

I pushed the button in the middle of the speaker, and a sexy voice promptly asked for my order. I went all out: a platter of fried chicken with french fries, cheeseburger, hot dog, side order of onion rings, strawberry shake and a cup of coffee with cream.

After the order was repeated to me in the same low voice, I waited 30 seconds, then pushed the button and told Orbis that I'd changed my mind; substitute fish for the chicken, change the malt to chocolate, bring some extra salt, and make the coffee black. That should foul her circuits.

Eight minutes and eleven seconds later my order was delivered by an attractive young thing definitely more robust than robot. I'd planned to argue over the bill, but it was plainly printed by computer, and totaled exactly right.

To make matters worse, it was the best meal I've ever had at a drive-in.

Complacently full of good food, I went inside and joined other customers who were gazing through picture windows at the mechanical wizardry in the kitchen; a gadgeteer's paradise. There's the constant clicking, clacking and whirring of precision thingamajigs, punctuated by an occasional pocketa-pocketa-pocketa as whirligigs whirl buns right and left, dingbats sweep onion rings onto conveyor belts and dohinkies push hot dogs out of squirrel cages into ovens. Food, in various stages of preparation, marches on belts in every direction.

In one corner of the room, Orbis bleeps away. Her operator and an assembly man would be the only humans required in the kitchen, but John Reimann Jr., 38-year-old owner of Jay's, likes to vary the menu with feature soups and sandwiches of the day, which are prepared by hand. Still, 80 percent of Jay's business is turned out by the mechanical chef.

When a customer punches a button on the speaker outside (or picks up a phone at his booth inside the restaurant), Orbis

winks a numbered light corresponding to that station. As the customer orders each item, the operator punches a corresponding key on the computer. When the order is completed and verified, she presses a master key which tells the check calculator to print the bill, and at the same time shoots the order to Mims for processing.

Mims (Menu Item Memory System) is a brain in itself. It not only provides a visual record of every item currently on order and in preparation, but also a running total of the number of each item that has been served so far that day. Mims also distributes orders to the individual cooking machines. Every single item is prepared to order; not one hamburger is cooked unless there's a customer for it.

However, all the machines and roller belts are in operation all the time. When Mims tells the hamburger machine to turn out a double cheeseburger, a knob pops out on a revolving drum. As the knob turns, it tells a submachine to shove a bun through a slashing knife, drop it on a conveyor belt and lift off the top half. Simultaneously it tells the pattymaker to squeeze fresh-ground hamburger into two molds and deposit them on a belt that crawls through a broiling oven.

Four minutes and seven seconds later the meat topples off the conveyor onto the bottom of the toasted bun, another gadget drops a slice of cheese on top, a squirter squirts a special sauce on top of the cheese (if ordered), the top half of the bun descends, and the piping hot burger is wrapped by machine in plastic film. Its contained heat continues to cook it for more than a minute inside the plastic, and at the same time melts the cheese.

Orders of chicken, shrimp, fish and onion rings are stored in refrigerators above the machines.

If you've ordered a shake or a soft drink, Mims turns on the appropriate pump and the liquid squirts into a cup until it rises near the top, where it breaks a light beam to turn off the pump.

All conveyor belts march straight at the assembly man, who fills the orders in accordance with the preprinted bills that the calculator has turned over to him. Carhops and waitresses promptly pick up the orders for delivery.

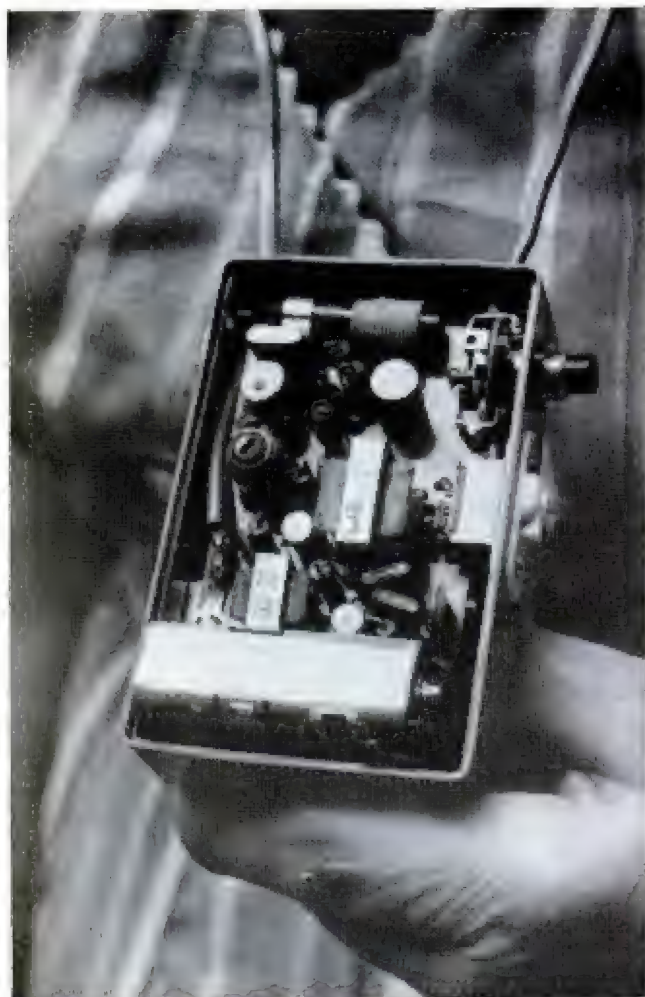
The AMF engineers had enough perception *not* to substitute gadgetry for the dazzling carhop. This automation jazz, after all, can be carried too far. ★★★

wrapped in plastic and accompanied by onion rings





Zap! Could it be a batboat? There's a strong rumor running from Hollywood to Texas that Batman is out to corral the forces of crime-on-the-water with a new weapon—the Batboat. Developed secretly by the Glastron Boat Co., Austin, Tex., the boat was used in a full-length Batman feature movie released last month.



Invalids and disabled people are prone to home accidents. Now, a new radio-controlled alarm ensures that help can be summoned. Consisting of a miniature, transistorized radio transmitter worn about the neck, the system operates lights, buzzers, flashing window signs (above) and unlocks the front door. The Electronic Auto Alarm is made by British Relay Ltd., London, England.



Good communications are possible even in dense jungles with this lightweight "Man-pack" radio developed for the Army. The 10,000-channel, single-sideband set is 18 by 12 by 4 inches. It can be carried and operated by one man, and unlike most combat radios, works on ordinary flashlight-type dry batteries, wet-cell batteries or from vehicle battery, standard powerline or field generator. The 29-pound, high-frequency set can operate over 500 miles.



Step climbing pram helps mothers get baby carriages up stairs easily and safely. The secret is a movable axle. Mom operates a bar at the rear of the pram which releases a catch on the chassis. In this way, one pair of wheels can rest on one step and the other on the lower step. Made in Sweden by Ilos AB.



Built to resemble a parachute, the Allied Landing Museum at St. Mère-Eglise was recently completed by the French construction firm of Dubigeon-Normandie. Designed by Francois Carpentier and made of stratified polyester, the museum is dedicated to the British and American paratroops who made the liberation landing. It contains thousands of wartime mementoes.

Drivin' with Dan

Were some of the Indy 500 drivers "a bunch of clowns"? Do foreign drivers cause accidents on American race tracks? Here are Dan Gurney's outspoken answers to these and other provocative questions



DAN GURNEY (left) wishes A. J. Foyt luck at Indianapolis just before the signal: "Gentlemen, start your engines!" Just a few minutes later both were out of the race in the devastating first-lap pile-up

We are proud to announce that starting this month Dan Gurney, considered by many the greatest all-around racing driver in the world, will join Popular Mechanics as a regular contributor. His column, "Drivin' with Dan", will appear in PM each month. In it, Dan will answer selected questions from readers on racing, high performance, and everyday driving. Send questions on these topics to "Drivin' with Dan," c/o Popular Mechanics, 575 Lexington Ave., New York, N. Y. 10017. Questions cannot be answered by individual letters. Questions on auto maintenance and repair should be addressed to the Auto Clinic. (See page 36.)

Robert P. Crossley
Editor

Q. After the wreck knocked you out of the Indy 500 in the first lap, you said that you "saw it coming for weeks and that you expected it. . . . These are a bunch of clowns." To whom were you referring, and why did you anticipate a big pile-up?
—Peter Cotton, Huntington, W. Va.

A. I was referring to the throttle-happy drivers who in fact caused the accident. That is precisely where I lay the blame—on the drivers, not on the pace car or even the starting formation. The start is the most dangerous part at Indy. I could see the likelihood of an accident happening in the month-long build-up of tension. That tension gets under a driver's skin and makes it easy for a guy who isn't concentrating on the serious realities of the situation to do something foolish. A few guys simply did something foolish or

that accident would never have happened.

Q. After the big crack-up at Indy, A. J. Foyt was quoted as saying, "I knew those blankety-blank foreign midget drivers would get us into trouble." Since none of them were involved in the crash, how does A. J. get around to blaming them?—
T. K. Marvin, Fort Wayne, Ind.

A. Frankly, I doubt that A. J. made such a remark. He is certainly a pro's pro and has always been quick to recognize ability. I neither observed nor heard of any instance in which the foreign drivers caused any trouble, except, perhaps, for wounding our pride with their fine finishes.

Q. What should the Speedway management do to prevent pile-ups like the one on the first lap

this year?—Robert M. Douglas, Altoona, Pa.

A. I believe the best preventive measure they could take would be to show pictures of first-lap or early-going accidents at the drivers' meeting. This would point out vividly how foolhardy it is to try to make much of a move before the field gets sorted out. A two-abreast start with greater distance between rows would undoubtedly also be safer.

Q. I say all sport cars and so-called "sporty cars" like the Mustang and Barracuda should have roll bars. Don't you agree?—Jack Blake, Milwaukee, Wis.

A. Yes, especially if they are going to be upside down.

Q. Who is the most competitive driver you have raced against?—John B. Patterson, Asheville, N.C.

A. I would not want to single out one, but it would likely be among a group including Jimmy Clark, John Surtees, A. J. Foyt, Mario Andretti and Graham Hill.

Q. Strictly from a driving-comfort and no-fatigue standpoint, what sort of car would you choose for a long-cross-country trip?—Larry Prather, Grand Island, Nebr.

A. Probably a Mustang or Mustang-type car with a handling-kit suspension package. In Europe, I would say the 250 SE Mercedes. Bigger cars don't have the agility necessary for as much comfort and safety as I like when I'm pressing all day over long distances.

Q. Why don't we have more Formula 1 races in America?—Steve Harris, Orlando, Fla.

A. Formula 1 racing means both cars and drivers must be flown over here from Europe, and that's expensive. I don't think American fans have reached the point where they realize what Formula 1 racing is. Until they do, it would be impractical to have more than one Formula 1 race over here.

Q. Why don't you drive in the Daytona 500 anymore? I know you can drive stock cars from your four wins at Riverside.—H. L. Mackey, Pensacola, Fla.

A. The Daytona 500 comes at a busy time for me. To do a good job there requires a 10-day-to-2-week stay, which I simply haven't found possible the last couple of years.

Q. How can I tell when my car needs new shocks?—George Smith, Oakland, Calif.

A. When you hit a bump and your car continues an up-and-down motion more than twice, chances are you need new shocks.

Q. I've heard that they are going to build a new speedway in Southern California that will be an exact duplicate of Indianapolis. Why would anyone want to duplicate a track that is 55 years old and obsolete?—Bill Zinzmaster, Salina, Kans.

A. A lot of people don't think Indy is obsolete even though it is an old track. Personally, however, I tend to agree with you.

Q. Everybody was hollering about oil on the track at Indy this year. Do rear-engine cars by their very design spray more oil on the track than the roadsters?—Oliver P. Scott, Roanoke, Va.

A. There is a slight possibility that this may be true, although I don't believe it's an inherent problem with a rear-engine car. There have been some pretty oily roadsters too.

Q. I read that the slow laps run under the yellow flag at the beginning of the Indy 500 were what caused Mario Andretti's engine to go bad. If this is true, why didn't it affect the other cars, too?—M. P. Henderson, Amarillo, Tex.

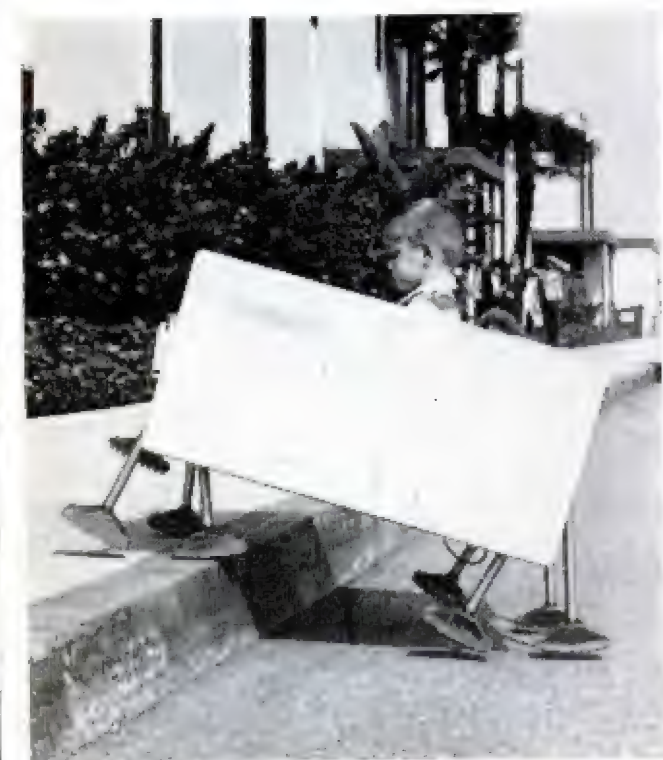
A. The yellow flag laps shouldn't have hurt anyone's engine. I don't pretend to know what Mario's particular problem was, but slow laps such as are run under the yellow flag pose no basic danger for cars or engines. You can't do much idling around with a dragster, but easy laps pose no problems for an Indianapolis car.

Q. Which is the most disappointing: to lose on the first lap, as you did at Indy or on the last lap as you did at Sebring?—Joe Adams, Los Angeles.

A. It's worse to lose on the first lap, I think. At Indy I didn't get a chance to show how well or how fast we could run with my car or how competitive we might have been. There is quite a bit of satisfaction in proving such points as these. It tends to ease the pain of even a last-lap disappointment. Although we were disqualified altogether at Sebring we were able to break the lap record and lead the major portion of the race. I'll take that anytime over a 50-yard scramble and flying wheels.



Snazziest snake pit in the world is this one in the Black Hills that's enclosed in a spectacular steel and plastic dome (right). Inside the dome (left) visitors can go to a "snake safari" among the nonpoisonous snakes and lizards, while birds and monkeys move overhead. The dome, which is 60 feet high and 113 feet in diameter, is just one of several display areas at the Reptile Gardens near Rapid City, S.D.



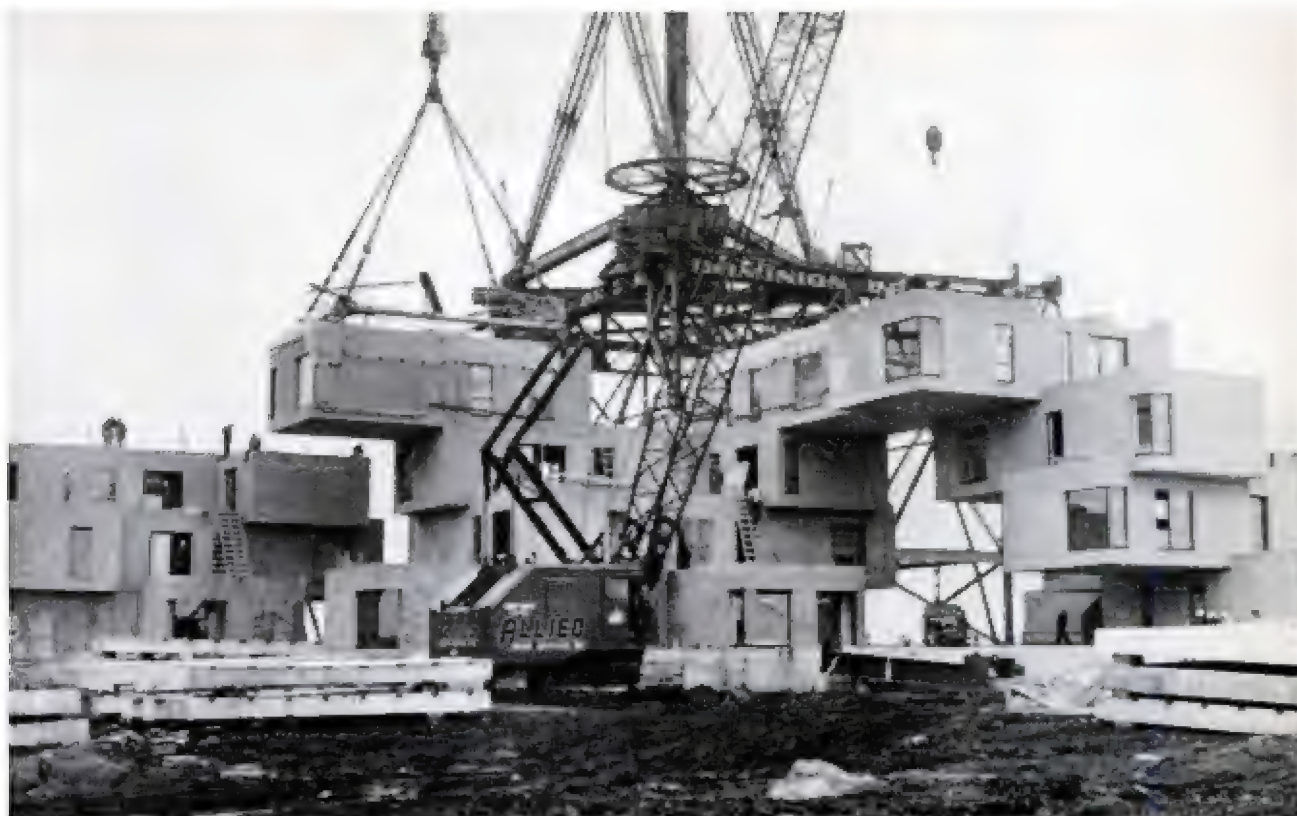
"Walking on the moon" may become a handicapped child's way of getting around. Utilizing the engineering developed for a moon-exploration machine, engineers of the Space-General Corp., El Monte, Calif., put together an eight-legged stick-operated walker that'll travel at two mph. A handicapped child can control the walker by hand, foot or chin. The battery operated machine can climb, turn and negotiate rough ground.



Rowing on dry land in this contraption keeps Yugoslavian athletes in trim all year round. The wheeled rig was built so rowers could practice even when rivers were ice-packed.



Ring-tail helicopter can zip along at 225 mph. The craft, a Piasecki 16H-1A, is a compound helicopter, with wings for lift in addition to the rotor. A propulsion propeller is in the ring at the tail. Power comes from a GE 1250-hp turbine.



Precast concrete "boxes" are lifted into place to form apartments in Habitat 67, an urban dwelling project that will be a major display during Expo 67, Montreal's world exhibition next year. The precast apartment units weigh up to 85 tons. The apartments will have from one to four bedrooms each, plus an outdoor garden that's watered and fertilized automatically.



Oil is okay on troubled waters, but in harbors it's a nuisance. To clear the gooey substance from the waters around Berlin, the West Berlin Fire Department has put this floating skimmer to work. It's shown here on its first run on the Havel River. The fire department gets one or two calls each day to remove oil from the water's surface. The machine can take up to about 70 cubic feet of skimmed oil per trip.



Backfiring realistically and holding its own in London traffic, this odd little car looks like another tiny vehicle for urban commuters. However, it was built just for an appearance in a comic opera—and it's propelled by pedals, at that. John Heatherington, the builder, is shown at the wheel.



Twenty-four piano students can be given individualized instruction simultaneously in a new Wurlitzer music laboratory. All pianos are electronic, and are connected to a communication center atop the teacher's piano. She can listen to any student and discuss his work privately through earphones without distraction to the rest of the class.



Flexible wings are now appearing as parachutes for Army paratroopers. Called a para-wing, the maneuverable gliding-chute can be steered over moderate distances to pinpoint landings. It can be folded, packed and deployed as a normal chute. The flexible wing was conceived nearly 18 years ago by Francis Rogallo, a scientist with NASA.



Between-size tractor is designed for maintaining golf courses, parks and playgrounds. The 18-hp engine is pivoted behind the riding unit, enabling the driver to make sharp turns close to shrubbery and trees. Accessories include a rotary mower, a snow plow, a grader blade and a dump cart. The manufacturer is Bolens Div., FMC Corp., Port Washington, Wis.



Sled for swimmers and skin divers is shaped like a paddleboat and scoots across the surface in much the same way. Swimmer lies on a slanted surface between two legs of the sled. He kicks in his normal style, and can stroke with his arms. The sled has a compartment with a transparent window on the bottom and a hinged door on the top, offering either a view into the water or convenient storage. It's made by SAEKO, Box 144, Malibu, Calif.



Pint-size bulldozer, built from scrap parts, not only serves as a toy but does real landscaping chores. Two Marine sergeants at Camp Lejeune, N.C., fashioned the miniature dozer from metal bedrails, a small automotive transmission and differential, a 7-hp engine and other salvaged parts. It weighs 900 pounds and obviously makes chores fun for the kids.



Boat precisely fits the top of a VW Microbus and requires no cartop carrier. Made of fiberglass, it is nearly 12 feet long. Luggage can be stowed under the boat for highway travel. The fast hull design minimizes wind drag at high speed. It's made by Kenar Co., Poway, Calif. 92064.

Adventures of an underwater cameraman

Dodging gas-propelled spears and submarines, hobnobbing with a killer whale and working eye-to-tooth with man-eating tiger sharks—this is all in a routine day for the top photographer of Hollywood's deep sea sagas.

By WILLIAM and ELLEN HARTLEY

LAMAR BOREN brings his huge 35-mm movie camera (in housing) to bear on a futuristic submarine designed for a new film, *Around the World Under the Sea*



"**N**AMU LOOKED AS BIG AS A SUBMARINE and twice as dangerous. Think of a tiger that weighs five or more tons, and you get the general idea of how it feels to be in the water with a killer whale."

This is Lamar Boren earning his daily bread. A burly, soft-spoken man, Boren is an expert scuba diver and the most sought-after underwater cinematographer in the world. In 20 years of underwater filming he has been eye-to-tooth with most of the denizens of the deep. This was his first contact with a creature reputed to be the sea's most vicious.

Captured in a fisherman's net and bought by Ted Griffin, operator of the Seattle Public Aquarium, the much-publicized Namu seemed friendly toward human beings. Griffin could feed him by hand and ride on his back, but how would he react to a stranger? On assignment for Ivan Tors' *Flipper* series, Boren was about to find out.

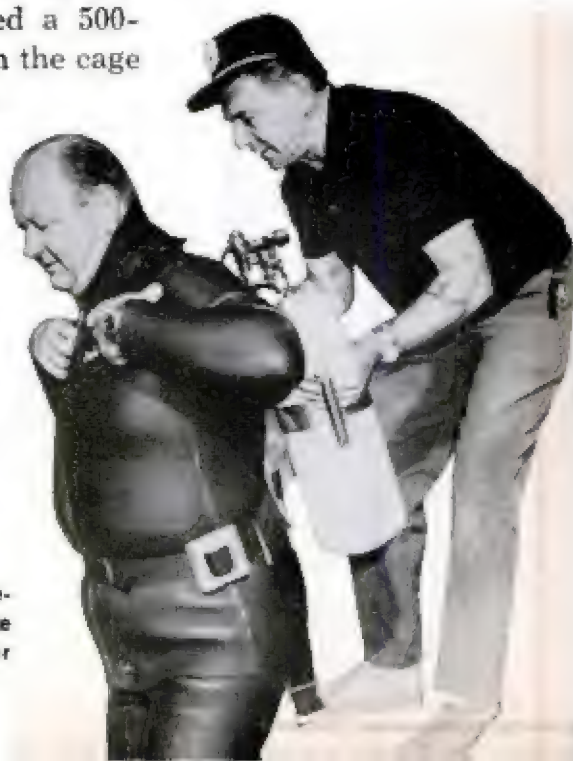
The water in the enclosure in Puget Sound was murky and Boren was busy adjusting his camera housing when Namu suddenly rushed at him with mouth open. "It was a terrifying moment," Boren said. "My teeth were making more noise than the camera." But this was just Namu's way of being playful, and he quickly warmed up to Boren. "I just hope he stays friendly until we finish the movie," Boren said. "I'd be a light lunch for a creature that eats 400 pounds of salmon every day." Namu remained a "playful" and powerful giant until last July when, during whale mating season, he tangled with the steel net restraining him—in an effort to gain freedom—demolishing the net as well as himself.

Flirting with danger is not a new thing for Boren. His reputation has been established by filming underwater thrills that keep movie-goers on the edges of their seats. During the filming of the James Bond movie, *Thunderball*, for instance, Boren had to photograph an underwater spear-gun battle. "This was unnerving," he said. "It was hard to work with those spears swooshing past me. I'd have been much happier with sharks."

Boren has often filmed man-eating sharks without protection, but when he did the underwater shark scenes for *The Old Man and the Sea* he worked from a cage, a necessary precaution because there were often as many as 100 sharks within camera range at one time, and the scene called for them to tear a huge marlin to shreds. "They were truly vicious," Boren recalls. "We got them worked up by throwing them raw meat, and when the marlin was put over the side they tore into it like buzz saws. They devoured a 500-pound marlin in three minutes. I was in the cage right in the midst of it, and it was the most terrifying, blood-curdling scene I've ever filmed."

Raised in Riverside, Calif., Boren started diving as a kid with a home-made helmet. During high school he became interested in photography, and after studying engineering at Riverside Junior College, he became a professional still photographer.

In the 1940s he joined the Bottom Scratchers Club, a famous diving



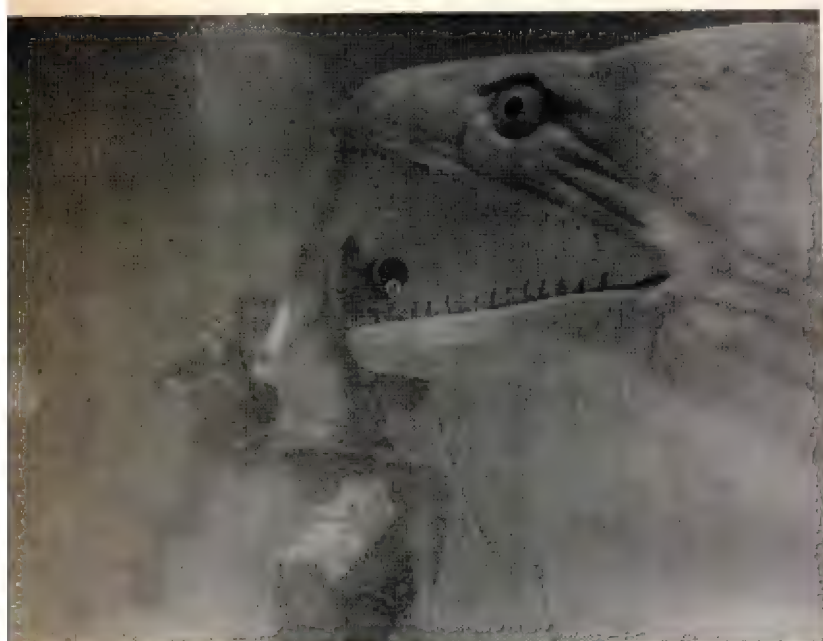
SUITING UP with the help of an aide, Boren prepares for a day of filming. In 20 years of movie work he has spent over 2000 hours underwater



TAMED WITH TRANQUILIZERS, a fearsome man-eating tiger shark is guided into position for Boren's camera to record a sequence of thrills for an underwater movie



SHOOTING THROUGH A WINDOW, Boren films the interior of an underwater sphere, the Hollywood concept of future aquanauts' living and working at the bottom of the sea



MOVIE MAKE-BELIEVE is provided by a giant moray eel built by a studio prop department. Boren makes adjustments that will add to the realism of the scene

BUOYANCY is important to an underwater cameraman. The diver must act as both dolly and crane, so the housing must be free to move with gyroscopic precision



club in San Diego. This was a do-it-yourself period in underwater photography, and Boren built his first underwater case for a 16-mm Bolex and started filming. In 1952 he built a 35-mm underwater motion picture camera, and his results with this rig were so good he landed his first feature film assignment, a treasure hunting epic starring Jane Russell, Richard Egan and Gilbert Roland.

This camera and housing were the result of years of grappling with the problems of underwater photography. "You need a camera that's free to swim in all directions," Boren explains. "You are your own dolly and crane and everything else while you're down there filming, so you and the camera have to become a unified controllable piece of equipment."

Boren's first job for Ivan Tors was *Underwater Warrior*, a movie about Navy frogmen, and it was also his closest underwater scrape. Shooting a submarine in murky water he suddenly saw the craft about 10 feet away and coming straight on. He dropped the camera and swam, getting away with just slight bruises.

"The last thing on your mind at a moment like that is to continue filming," he

said. "You just move as fast as possible."

His next assignment for Tors was the television series, *Sea Hunt*, filming almost all of the 155 episodes. He also did 32 segments of *The Aquanauts* for television. His credits also include the feature films, *Flipper*, *Flipper's New Adventure*, *Thunderball*, and *Around the World Under the Sea*.

"Simplicity is the key to successful underwater photography," Boren explains. "A camera housing should have big control knobs and dial indicators. It should be so simple that you can operate it wearing boxing gloves."

He feels that amateurs tend to make photography too complicated. "Hit for the nearest exposure you can guess at," he says. "Or take a light meter down in a mason jar."

First impressions often make the best pictures, Boren says. "Even the underwater world can become commonplace, so the novice should shoot whatever intrigues him on first sight and then move on."

Boren scoffs at the dangers underwater. "Just be a safe, sensible diver," he says. "As in everything else, the adventures are a result of mistakes or accidents." ★ ★ ★



Correspondence school by radio

By JAMES R. BERRY

Now mail-order courses come over the air to students who answer instructors by pushing buttons, and who are told if they're right or wrong—and why

LAST JUNE 6, at exactly 8:00 p.m., 100 Philadelphia men opened an exercise book in their homes, turned on a special radio—and inaugurated the biggest innovation in correspondence schools since the mailbox.

For one hour, the duration of the day's lesson—the first of 30 in "Modern Management"—the announcer explained sections of the material. After each explanation he shot a question at his listeners, detailing up to four possible answers. Then he told the students to make a choice.

Each listener jabbed one of four buttons atop his radio. If the pressed button corresponded to the correct answer, the in-

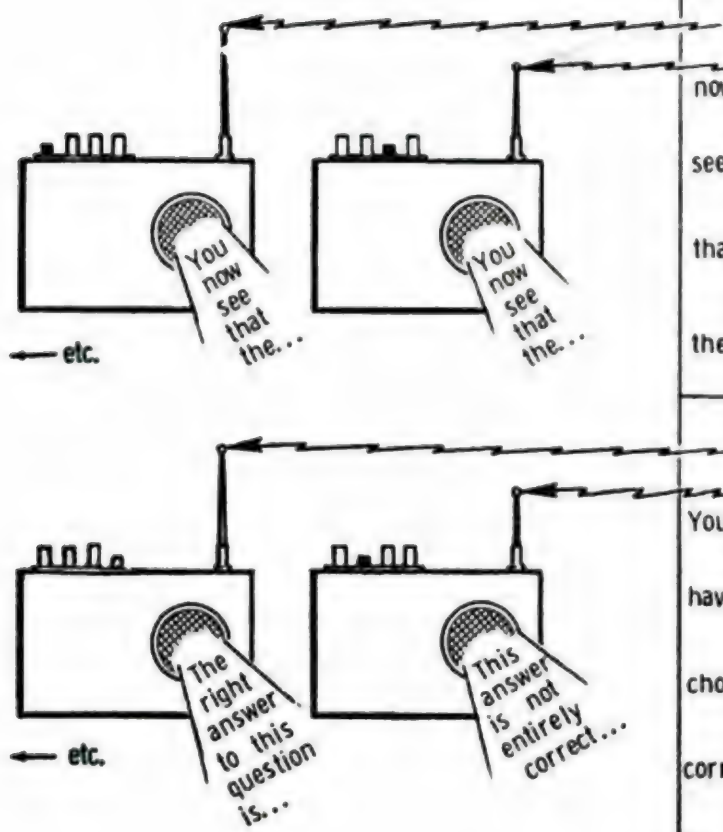
structor elaborated on the response. If the student hit the wrong button, he heard what the correct answer was and why. After dealing with the responses, the instructor went on with the lesson.

Called Educating, this broadcasting technique of probing a student's knowledge with questions and immediately giving him an answer, turns what ordinarily would be hour-long lectures into 60-minute periods of active learning.

"Learning is work, just as playing tennis or shoveling coal is work," explains John Villaume, president of the International Correspondence Schools, the outfit that programs the radio courses. "But a



STUDYING BY RADIO IN HIS HOME, student answers instructor's question by pushing one of four buttons

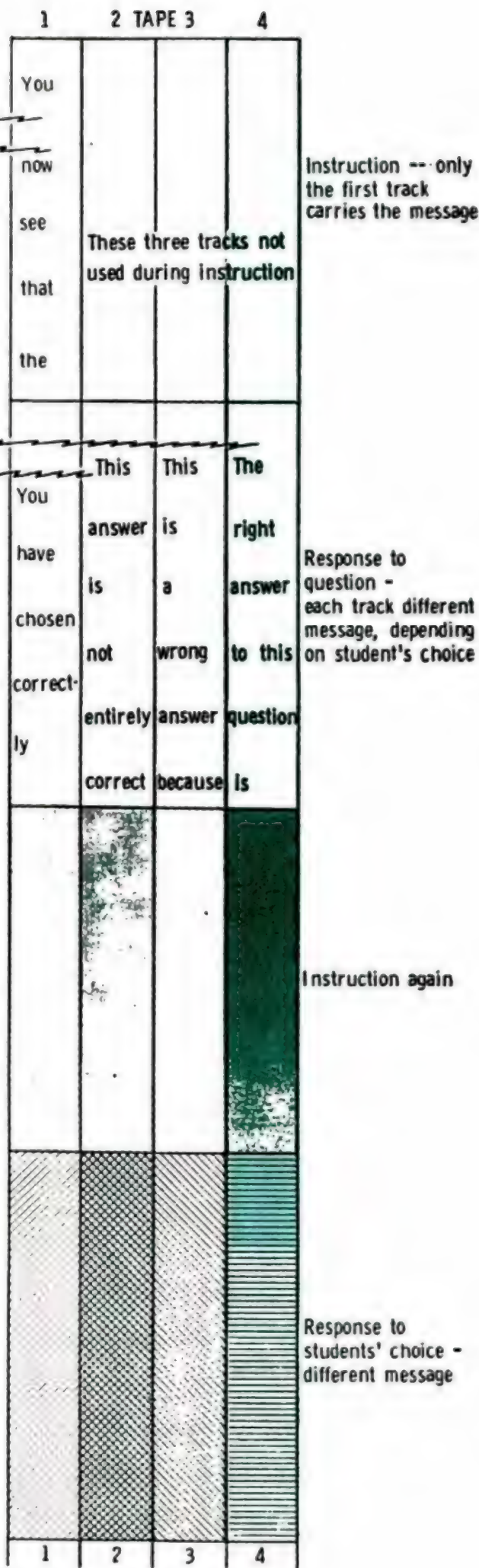


STUDENT SELECTS one of four possible answers to a question (left), and pushes the corresponding button on his receiver. He receives a taped reply telling him whether he's right or wrong. If he made wrong choice, he's told why it is incorrect. Diagram (right) shows operation of four multiplex channels

guy playing tennis is *participating*, and he calls it a game. A man shoveling coal isn't really involved and he calls it work. Having students make constant choices makes them participants in the learning process. Consequently, the idea of work is forgotten and learning comes easier and faster."

The idea behind Educating is rooted in the same principles governing teaching machines. Information is broken into small, easily digested doses that are presented in logical order by the instructor. After a student has understood an elementary unit of the material, he's fed a more complex dose, gradually tackling more difficult information until the course is finished.

Application of teaching machine methods to correspondence schools resulted from a recent FCC ruling that allows FM stations to "multiplex" several channels with a main frequency. Some FM stations do exactly the same thing to create stereo:



It's one of the unique bits of magic in radio waves—similar in concept to the way that the main stream of a jet pump entrains water. But here the analogy ends because each multiplexed channel is equivalent to a separate station; yet, it doesn't interfere with the regular broadcasting of its mother station or others on the dial. Buttons on a radio designed to receive these separate channels-within-a-channel electronically select one of the four for broadcast.

Educasting uses a four-track tape, with each track carried on one of four multiplexed channels. During instruction, course material is beamed over the first channel. To receive it, students press button one. After a question, all channels—and tape tracks—come into play. Responses to a question are on different tape tracks, thus are broadcast over different channels. The instructor announces the possible answers and assigns a button to each one. The student jabs a button, thus selecting a channel and receiving the message on the corresponding tape track.

Programmers at ICS try to cover lessons in a lively, entertaining manner. Practically every aspect of a lesson is illustrated with an actual example or case history.

One section of the modern management course, for instance, covers foreman-employee relations. After discussing how supervisors should handle disputes, the

instructor underscores his points with the story of a worker who was accidentally deprived of his week's quota of overtime. The worker, demanding payment, complains to the foreman, correctly pointing out that company rules require equal distribution of overtime. The foreman refuses, saying he'll let the worker make up the lost overtime. The worker, unsatisfied, brings his complaint to a grievance committee—and wins. Why? The instructor cites these three possible reasons:

- Rescheduling of the worker's overtime for the next week would disrupt the overtime of other men. (The instructor then announced that those who think this is the correct answer should push button one on their radio.)

- Even though the foreman made an honest mistake in overlooking the worker's overtime, the company is still responsible for the error by its own rules. (Button two is the one to press here.)

- Since the company rule for equal distribution of overtime existed, mistakes demoralized the workers. To keep up morale—and production—the worker was granted payment. (Button three.)

The correct answer: number two. Listeners who pushed the second button heard the announcer explain why company rules on overtime actually bind the foreman to pay the worker. Students who

(Please turn to page 188)



NORMAN LIVINGSTON (left), inventor of Educasting, checks out special receiver and equipment that multiplexes four channels over Philadelphia station



PATTERN ON THE TV SCREEN is divided into four equal segments. When student makes choice and pushes button, corresponding segment gives response



Invisible fence, set up by laser beams, is under study by military engineers. Infiltrators would unknowingly interrupt the beam to set off an alarm. The transmitter and receiver are powered by flashlight batteries. One set can cover up to one mile.



Dense net of chains protects big road-equipment tires from blowouts caused by rocks more than three inches in diameter. In one test the chains saved 60 cents an hour in rubber wear. Each set weighs 4430 pounds, so the chains also materially improve traction.



Rough life? Hardly, in this super-camper for pickups. It has virtually all the conveniences of home, including a combination dressing-room-lavatory with shower and toilet, a kitchen complete with built-in appliances, and "sky seats" for watching the world roll by from the top "floor." There's sleeping room for six persons. The camper is manufactured by Del Rey Industries, 3958 Cassapolis, Elkhart, Ind.

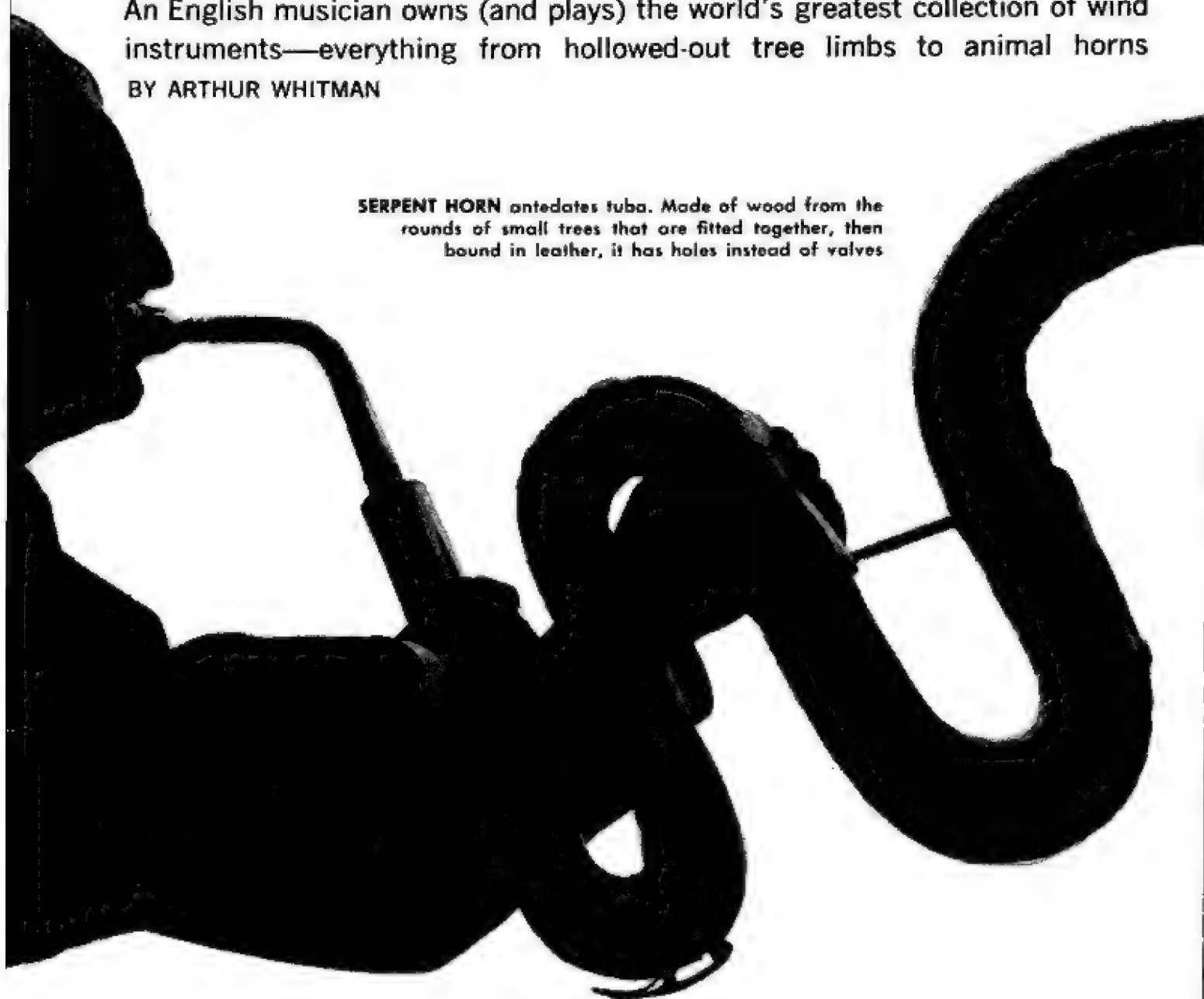


The music goes round and round ...and comes out over yonder

An English musician owns (and plays) the world's greatest collection of wind instruments—everything from hollowed-out tree limbs to animal horns

BY ARTHUR WHITMAN

SERPENT HORN antedates tuba. Made of wood from the rounds of small trees that are fitted together, then bound in leather, it has holes instead of valves



ONE LOOKS LIKE a thick, undulating serpent. Another like a random section of pressure piping. A third resembles, well, it resembles what it is, a length of half-inch rubber hose with a funnel stuck in one end. Snake? Pipe? Hose? Yep, and they're all musical instruments, and they're all played by one man. Godfrey Kneller, originally a trombonist with the Royal Philharmonic Orchestra under the late Sir Thomas Beecham, became known as a man with a "flexible lip," because he could play more than one brass instrument. Because of his versatility, he was asked by Sir Thomas to demonstrate brass instruments in lecture tours before schools. It led to later appearances and to seeking out other unusual wind instruments he could use. Among them are an authentic prehistoric buffalo horn bought from an archeologist, a ram's horn of the kind used against the walls of Jericho, and the weird wild instruments shown here.

CONTRA-BASS TROMBONE features two slides. Wagner wrote parts for it but orchestras stopped using it, even for his music. There just weren't enough musicians around proficient at playing it



OPHICLEIDE HORN bridges gap between serpent and tuba. Developed in Russia in 1860s, this is one of first made. Other horns in Kneller's collection are little more than twisted pipes



HANDLEBAR HORN is just that—a bicycle handlebar that Kneller blows to produce sound like you get from Coke bottle. Despite rare collection, Kneller considers himself mostly a musician



He's always ready to go...

His station wagon looks like a rolling tackle shop, and his boat is a well-planned fish-catching machine. Dick Kotis says you can catch more fish by organizing your fishing gear. Here's how he does it

By GEORGE LAYCOCK

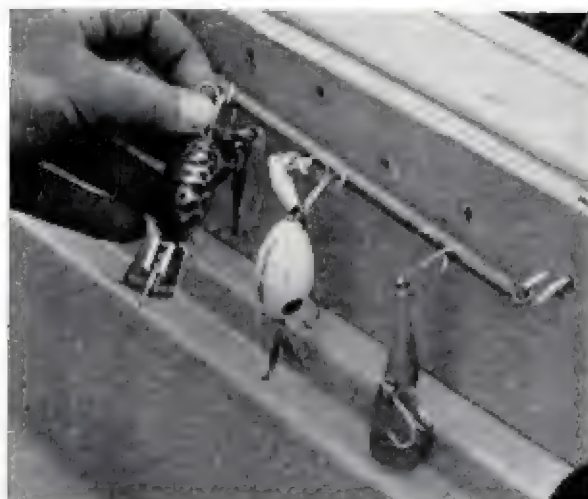




REMOVABLE CHAIR has a base which slips inside a pipe socket so it can be turned in any direction for casting. Dick made it himself by welding a pipe framework to an old office swivel chair



STORAGE CHEST made by enclosing space beneath a seat provides a dry place to put rain gear, tools, lunches and other necessities. It keeps the boat free of clutter, ready for fishing



LURE HOLDER, Dick's first addition to the boat, is just a screen-door spring stretched between two hooks. It does the job, though. The lures don't bounce out and they're always within reach



HOT AND COLD DRINKS are always carried in the same place—seated in a recessed base and secured to the side of the boat with a screen-door spring. They're easy to remove, but can't fall over

IT ALL STARTED with a big one that got away. One warm Florida evening several years ago Dick Kotis was casting underwater lures on a small lake when he spotted a huge fish feeding just beneath the surface.

"I reached into the tackle box for a surface plug," he says, "but found that the one I wanted was down in the bottom." In the process of digging out the right lure, he accidentally bumped the side of the boat. "And that was the last I saw of my big fish," Dick recalls ruefully.

Not wanting to make the same mistake twice, he installed a simple lure holder in the boat—a screen-door spring stretched along the inside within easy reach of the seat. "It made a handy place to hang all the lures I might need in an evening's fishing," he says, "without having them scattered all over the boat."

The screen-door-spring idea worked out so well that Dick was soon adding other innovations to his fishing boat and to the station wagon in which he carries all his fishing gear. Each of his ideas has but one aim—to organize the equipment

DON'T BE FOOLED by the apparent confusion in Kotis's boat, left. Everything is there for a purpose

more efficiently so he can forget about unnecessary details and concentrate on fishing.

When Kotis talks about fishing, his words carry a lot of weight. In addition to ranking among today's most skillful fishermen, he's president of the Fred Arbogast Co., one of the country's largest manufacturers of artificial lures (the Jitterbug, for instance). Fishing is his job.

Dick has been fishing as long as he can remember, and like any true fisherman, he has some definite ideas on the subject. One of these is that a good fisherman must keep his equipment in orderly arrangement. He should be ready to cast at any time with a minimum of fuss.

Long ago, Kotis concluded that the more comfort you build into a fishing boat, the longer you can stay out on the lake and the more chance you have for catching fish. This means plenty of hot coffee or tea in the winter and cold drinks in the summer. Instead of having a couple of Thermos bottles rolling around the bottom of the boat, however, Dick fashioned a special holder to stow them out of the way.

Another comfort feature is a swivel chair mounted on a pipe base which can be removed when the boat is being trailered. "Casting from the back of the boat,"

he says, "I can swing the chair in a 360° circle and fish any spot around me."

When fishing alone, though, Dick usually casts from the bow where a foot-controlled electric trolling motor is installed. He sits on a box hinged to the front seat, which also serves as a storage compartment for his electronic fish finder.

Additional storage was provided by enclosing part of the space beneath the seats. This gives him a place to stow rain gear, lunches, a first-aid kit, and tools.

In his station wagon, Kotis has a definite place for storing each item of fishing equipment. "I decided long ago," he says, "that I wasted too much time assembling fishing rods when there was good fishing water in sight." He now has a set of rod racks installed in the roof of the wagon so the rods can be carried already set up. Another carrier with snap-off pouches hangs over the back of the front seat, and the storage space beneath the floor has been partitioned into compartments.

The Kotis ideas for instant fishing can work for anyone. Just remember that the guy who catches the most fish is likely to be the one who spends the most time actually fishing, the one who's always ready for the next cast. ★ ★ ★



UNDER-DECK STORAGE in station wagon is partitioned into compartments to keep the equipment in order



GADGET CARRIER hanging from the front seat has snap-off pouches which can be carried to the boat



BOW SEAT, a box hinged to the boat's front seat, is also a storage compartment for Dick's electronic fish finder. Using the foot control, right, he can regulate the operation of the electric trolling motor



ROD RACKS in the top of his station wagon hold all his rods assembled, so no time is wasted once he reaches good fishing water. In the boat, he always has two fully equipped rods with different lures



Midget two-man subs, Star II and Star III, to be used principally for deep-sea research, get their first taste of salt water as they are launched by crane by General Dynamics Corp. With tail fins and "rudders" they look like chubby aircraft. The larger can operate at a depth of 2000 feet, has a range of 15 miles and a speed of five knots. The Navy foresees use of such subs in surveillance.



Extension handle for outboards permits midships control of throttle and steering. The handle can be snapped on or off in seconds, and extends from 28 to 37 inches, with locking positions at three-inch intervals. It's made by Waukegan Outdoor Products, 1534 Washington St., Waukegan, Ill.



Cushion-soft touch-downs on a carpet of air make it possible for planes to land on rough fields and unimproved strips. The new technique, developed by Bell Aerosystems Co., is similar to that of ground-effect machines. An inflatable ring covers much of the aircraft's belly. As the plane nears the ground, jets lay down a cushion of air beneath it. The plane thus is supported inches off the runway until it loses speed and stops.



Kite flying is a snap for Hank van Meekeren, a staff photographer for the Holland-American Line. To take aerial photos of the S.S. Statendam at sea, van Meekeren built a Bleriot-type kite modified to have a bar suspended from the body of the kite to hold a camera which is triggered by a music box-type shutter release. He can shoot an entire liner from 300 feet.



Spring-loaded "gun" is used at Canada's University of British Columbia to "fire" tree seedlings into the ground. Gun bores hole before shooting plastic "bullets" (above) containing seedlings, into the soil. As roots grow, they crack open bullet along vertical slit in casting. A "clip of ammo" contains two dozen bullets. Gun enables one man to plant 1500 seedlings an hour, about 10 times faster than by hand.



That pesky PCV

By MORT SCHULTZ

PCV (positive crankcase ventilation) is the anti-air-pollution system in modern cars. Be nice to yours—or you may end up with a ruined engine

NIGHTCLUB COMEDIANS used to get a lot of laughs with jokes about Los Angeles' smog. But gradually the laughter stopped—and so did the jokes. Today urban smog (air pollution) has "gone national" and is recognized for what it is: a serious hazard adversely affecting the health and well-being of millions of our citizens.

Carbon monoxide is the principal ingredient of polluted air, and the principal source of carbon monoxide is the automobile. In 1961 California passed a law requiring that all new cars sold in that state be equipped with a positive crankcase ventilation (PCV) system, or blow-by device. Two years later similar laws covering new cars were passed by other states.

Nevertheless, PCV has not been enough to offset the ever-rising pollutant levels of our atmosphere. New federal legislation will make it mandatory for all 1968 cars to be equipped with a new, more effective type of blow-by device. Until then we'll all have to make do with the PCV systems built into current models.

Watching your PCV Ps & Qs

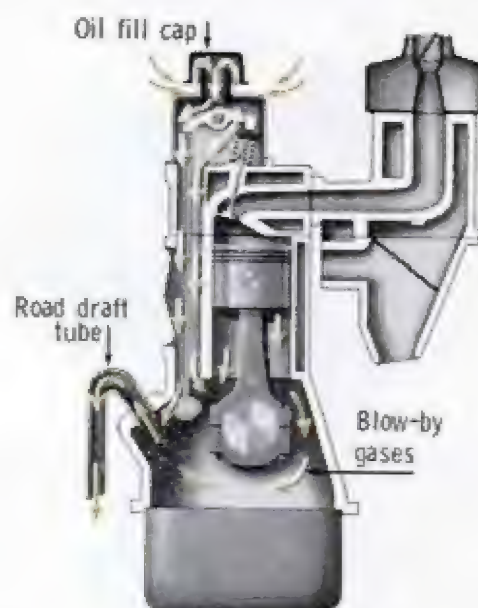
The one thing to remember about a PCV system is this: *If it is not properly maintained, it will ruin your car's engine.*

The fact is that even today, three years after its introduction, PCV is still a big mystery to many car owners—and maybe you're one of them. To find out, see how well you do on the following quickie test:

1. What is PCV and how does it work?
2. What are the consequences if PCV maintenance is neglected?
3. What are the trouble signs when PCV begins going on the blink?
4. How often should PCV be serviced?



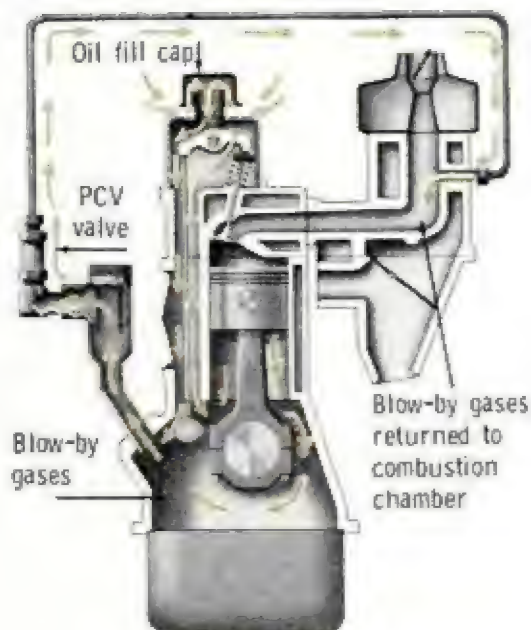
HEART OF A PCV SYSTEM is this valve which



ON CARS BUILT PRIOR TO 1963, engine exhaust was—and still is—thrown out into the atmosphere through a road-draft tube leading from crankcase



regulates air flow into engine's combustion chambers



PCV HAS BEEN REQUIRED on cars built since 1963. Typical system (above) shows how blow-by gases are led to combustion chamber for after-burning

5. How do you service PCV?

Well, how did you do? Don't worry if you flunked; chances are the guy down the street did too.

PCV—what it is, what it does

Every car has a ventilating system designed to get rid of blow-by gases produced by combustion. These contaminating gases consist of water vapor and fumes which, if not purged from the engine, will cause sludge and varnish to form on moving parts and permit internal rust and corrosive acids to build up and damage highly polished engine components.

In cars built prior to 1963, engine ventilation is achieved by vehicle motion. As the car moves forward, a low-pressure area is created in a road-draft tube that protrudes from the lower end of the crankcase. At the same time, air rushes into the oil-filler tube via the cap and passes into the crankcase where it picks up crankcase gases and fumes (so-called blow-by) and carries them out into the atmosphere through the draft tube.

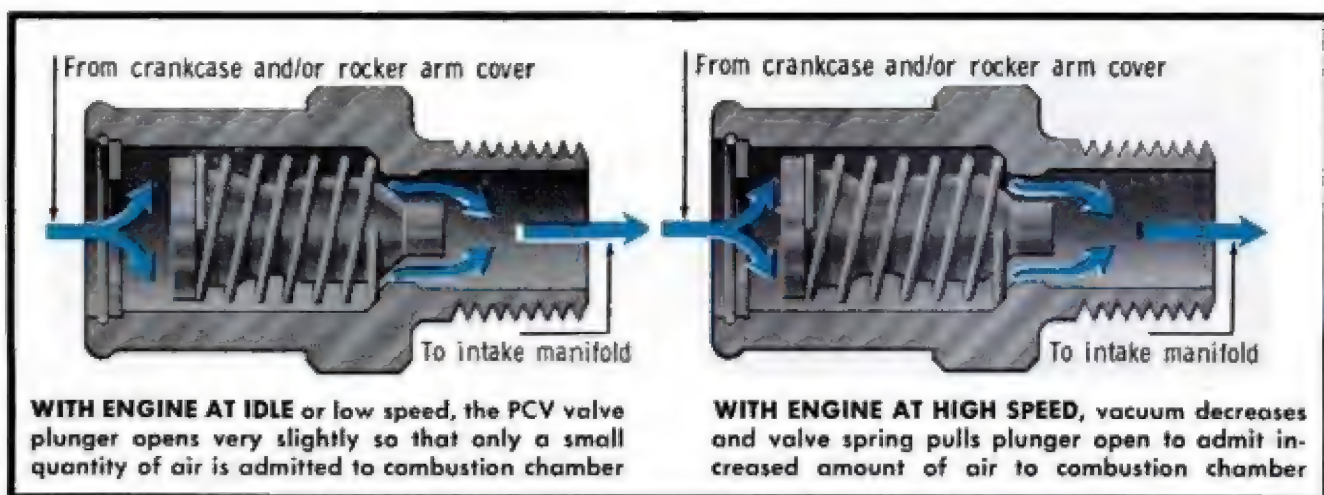
The discharging of these contaminants into the air which we breathe is what PCV is designed to prevent. PCV uses the vacuum created in the engine's intake manifold to draw blow-by from the crankcase and return it to the combustion chambers for burning, instead of pushing it raw into the atmosphere.

As with the road-draft tube setup, air enters the oil-filler pipe and goes into the crankcase where it picks up blow-by. However, the PCV system is "closed"; that is, it has no outlet into the atmosphere.

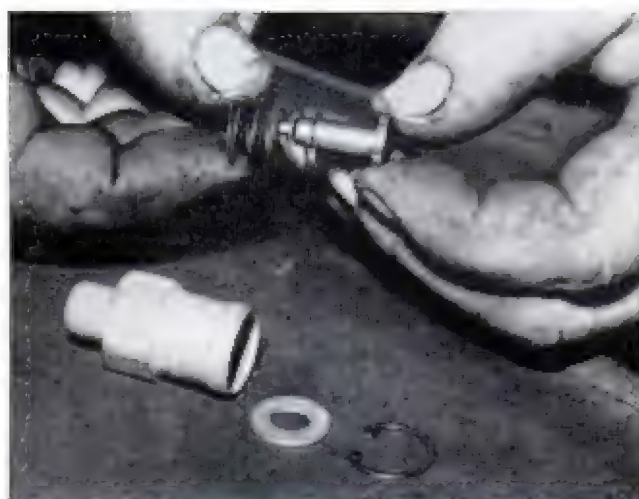
Engine vacuum in the manifold pulls the contaminant-loaded circulating air from the crankcase into the lower end of the carburetor—or directly into the manifold—by means of a ventilating hose. The contaminated air then passes into the combustion chambers where it is burned and then exhausted.

The heart of PCV is a valve which regulates the flow of air into the combustion chambers so that contaminated air coming from the crankcase doesn't upset the proper fuel-air ratio necessary for efficient engine operation.

At idle speed, for example, intake manifold vacuum is at its peak. If vacuum were allowed to pull a maximum amount of air into the combustion chambers, the air would upset fuel-air ratio and idling



USE PCV TESTING INSTRUMENT (about \$8) to measure air circulation through crankcase while engine idles



PCV VALVE ABOVE can be taken apart. Some valves can't be taken apart, but both types can be cleaned

would be rough. However, the high vacuum created in the manifold overcomes the tension of the valve spring and moves the valve plunger all the way forward to its low-speed position. With the plunger thus set, a minimum amount of air is allowed to pass into the intake manifold.

As engine speed increases, manifold vacuum decreases and the valve spring tightens up, forcing the plunger to move gradually backward and allowing more air to flow into the intake manifold. Naturally, blow-by increases as engine speed increases.

Another purpose of the PCV valve is to guard against a crankcase explosion should the manifold backfire. Manifold backfire must pass through the valve before getting to the crankcase. When the valve plunger is shoved back by the backfire it prevents the backfire from entering the crankcase.

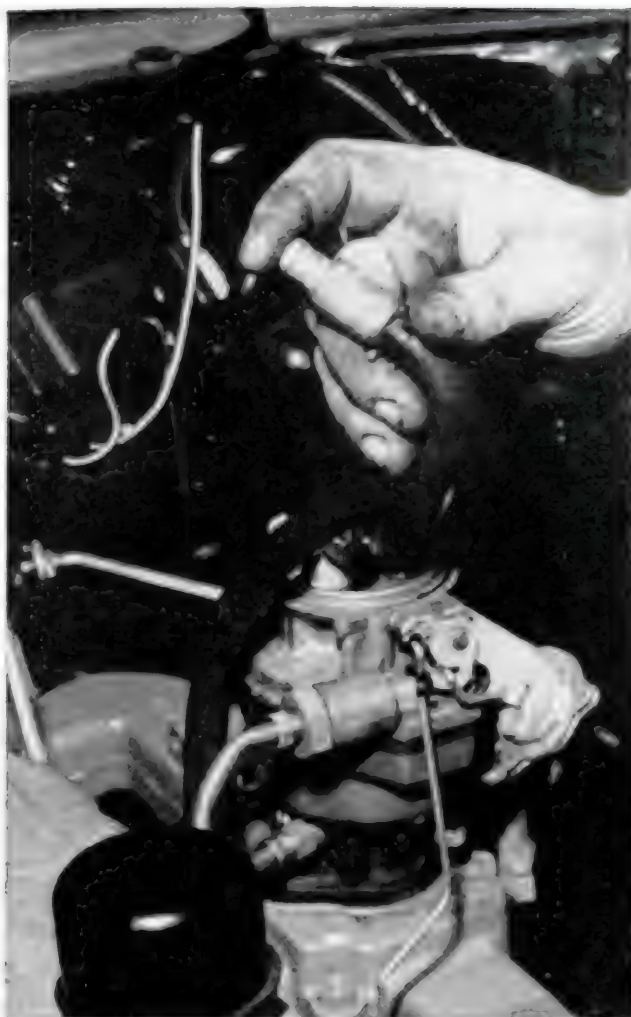
One sure sign of trouble in the PCV system is when the spring valve starts jamming in the open, closed or in-between position as a result of sludge

buildup. Then fumes left in the crankcase will begin to cause an accumulation of varnish, rust and acids. Sludge may also get to engine parts via the intake manifold.

You can buy a PCV testing instrument for use in checking out the system. It's a pressure-sensing device that measures air circulation through the crankcase while the engine is idling. These sell for about \$6 to \$8 at auto supply stores.

In use, the tester is placed over the oil-filler tube when the engine has reached normal operating temperature. Idle the engine and look directly into the tester glass to check the color indicator. Green tells you the system is okay; a yellowish hue indicates that the valve or system is partially blocked; and red means that it's badly blocked.

You'll find one of two types of valves in your PCV system. In most cases it's a crimped valve that can't be taken apart for cleaning. Remove it, soak it in solvent, then blow it dry with compressed air. Now shake it. Listen for the clicking of



CHECK SYSTEM by flicking finger over valve end of hose; vacuum should be good, engine idle should vary

the plunger as it moves back and forth. If the plunger doesn't click, it's plugged up with sludge and the valve (about \$2) should be replaced.

The other type of valve can be taken apart for cleaning.

Both types of valve consist of a plunger, spring and valve case. The take-apart kind is disassembled by pulling a retaining ring and removing a washer to get to the inside parts. Brush all parts clean in a pan of solvent, but be careful not to stretch the spring.

When reassembling this valve, make sure the spring is pushed well back onto the plunger so that the plunger will be squarely seated during operation.

To test the rest of the PCV system, start and idle the engine. Hold your finger over the open end of the ventilating hose or valve. You should feel a strong suction, and engine idle should vary as you cover and uncover the end with your finger. Weak suction or lack of engine-idle variance indicates a plugged-up hose.

Look at the system. Most Sixes and

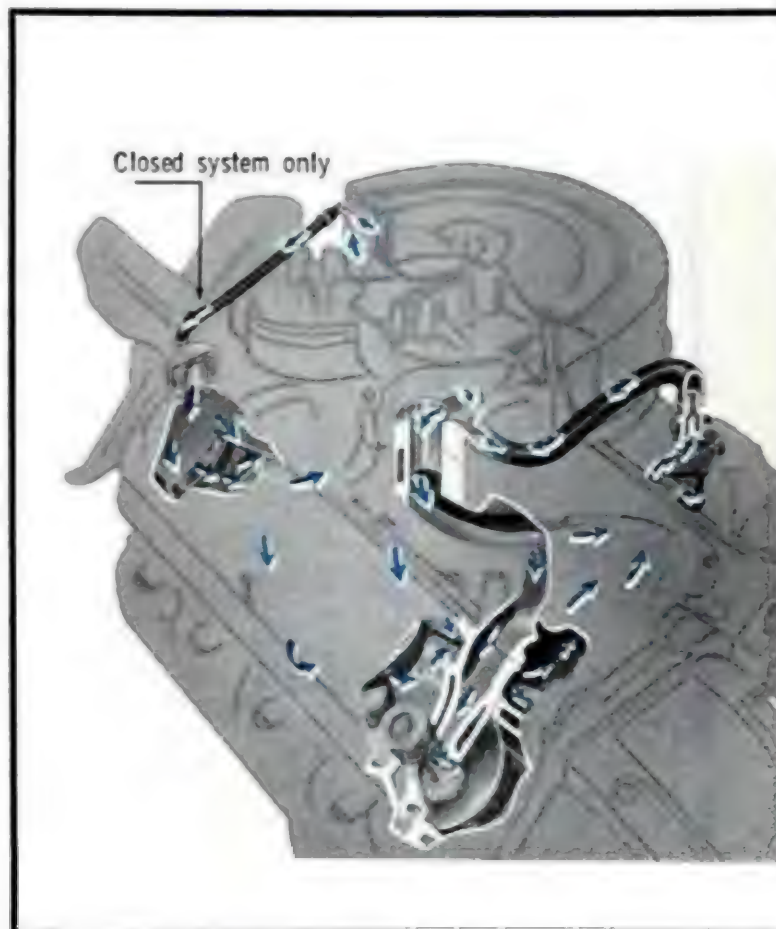
V8s have only one hose—the one going from the crankcase (or rocker-arm cover) to an inlet in the carburetor, or directly to a nipple on the manifold.

However, some engines use the so-called closed PCV system. This system is identified by a hose running between the oil-filler cap and the carburetor air cleaner. The closed system is the same as the other except that incoming ventilating air is picked up at the carburetor air cleaner, then travels through the hose to the oil-filler cap which is otherwise closed to the atmosphere.

In a closed system it's very important that the carburetor air cleaner be cleaned or replaced whenever the PCV is serviced. Hoses should be removed, cleaned out with solvent, then blown out with compressed air. Cracked and worn hoses should be replaced.

In those systems where hoses connect to the carburetor, it's not unlikely for the carburetor passage to get dirt-clogged. You can ream out this passage with a piece of wire or small drill bit, but be

(Please turn to page 180)



A CLOSED PCV SYSTEM is illustrated in above drawing. Note hose that connects carburetor air cleaner to oil filler cap. It is responsible for carrying circulating air through system to the crankcase



Home is

Big 42 page home-remodeling section

10 idea-packed features:

Eleven weekend projects

Adding a window to a paneled door

Give your wife a break with a sewing or laundry workcenter

Swing-down kitchen cupboards

Exciting new building products

Deluxe bathroom for a modest home

Build this home "wonderbar"

Once a grill, now a fireplace

9 novel hinges — can you guess what they're for?

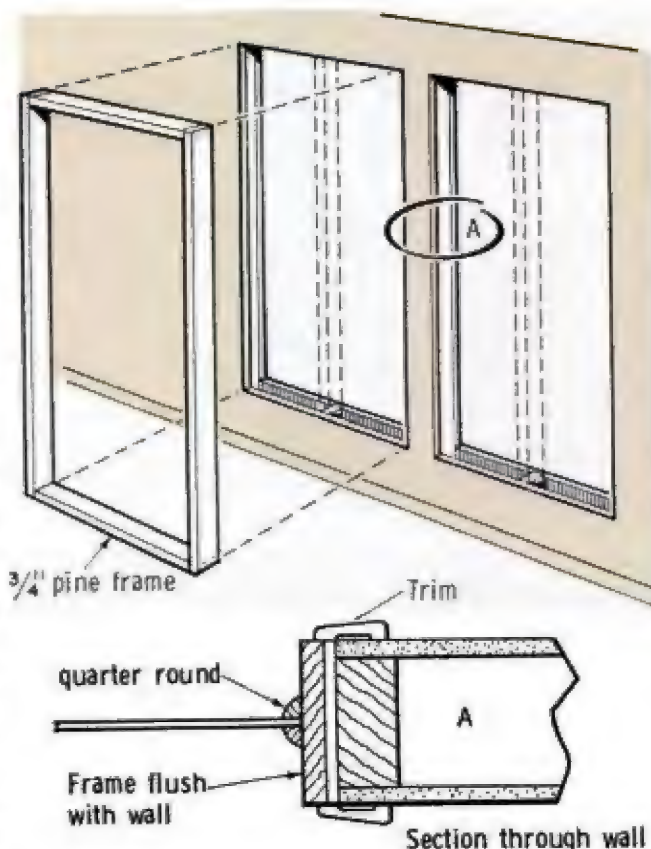
Add-on bay takes load off garage

Plus: Handy clip-and-save reference chart on basic remodeling measurements, shortcuts and tips, homeowners clinic and many other exciting ideas for the do-it-yourselfer

11 Weekend projects

LOOKING for quickie ways to add working convenience and eye-appeal to your home? Here are 11 such projects for you to browse through which cover every room of the house. Perhaps you'll find at least one which will spark your interest and be adaptable to your own home. Some may require more than one weekend.

1 SKYLIGHT WALL. If you have a non load-bearing wall that separates kitchen and dining room, decorative panels of fiberglass framed in the wall will create a most dramatic day and nighttime effect. Light from either room illuminates the other. It requires cutting rough openings through the wall, framing them on both sides with trim like a door and holding flat sheets of translucent Barclite in the openings with strips of quarter-round molding. Locate the studs that are to be sawed out first. This will let you chop away enough wall to make it easy to spot the others along which you will saw in forming the openings. Don't worry about the wall falling down. Since it is not load-bearing, and the studs are not adjacent, the removal of the two members will not weaken it appreciably. The frames which line the openings are made so they're flush with the wall on each side



what you make it!

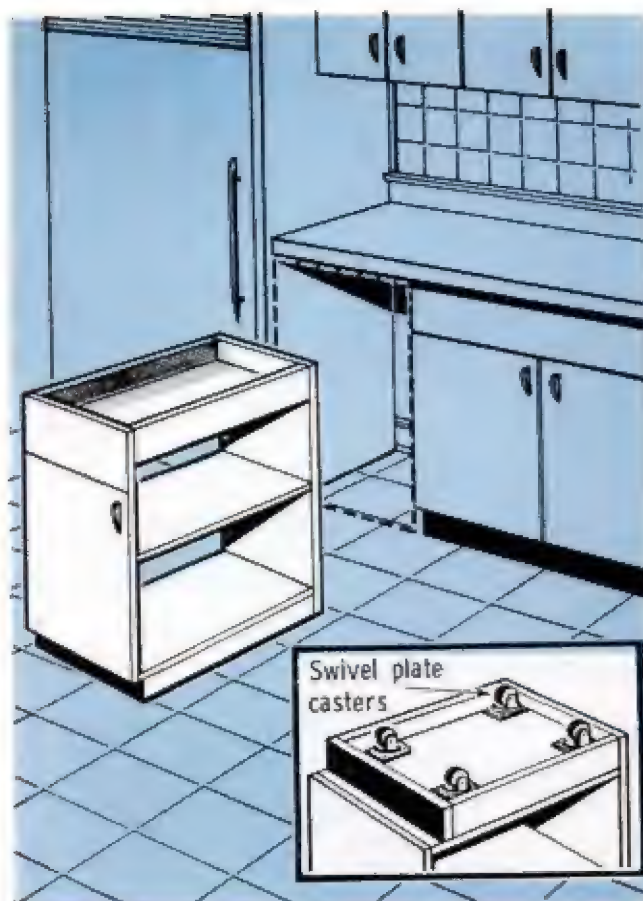
THE ADAGE, "*Home is what you make it*", certainly could have been coined by the do-it-yourselfer. For it couldn't apply more appropriately than to the guy who gets a kick out of remodeling his home and fixing up his yard.

To him it's not a mere money-saving chore, but more a fun sort of thing that brings great enjoyment and relaxation to one who likes to work with his hands—who gets a charge from being handy.

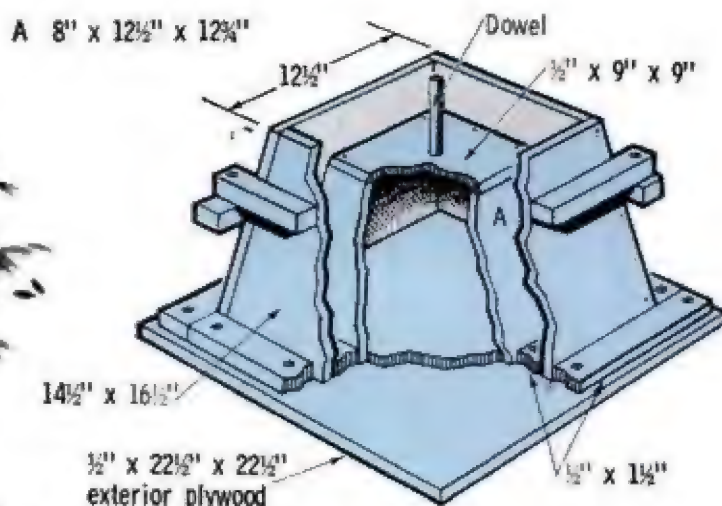
Who is this rare and wonderful breed of guy? To some he's the oddball next door who is ripping out his old bath. He's the character up the street who's adding a patio out back. He's some sort of a nut who'd rather grab a hammer than a golf club.

But in being one of the breed yourself you know that he's a guy who's having the time of his life enjoying the rewarding and relaxing hobby of "*making his home what it is.*"

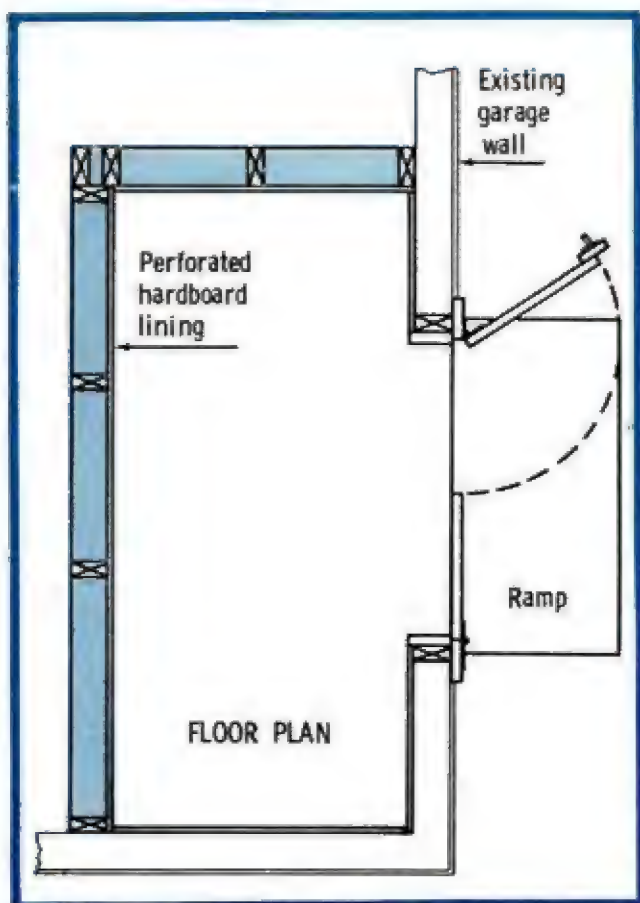




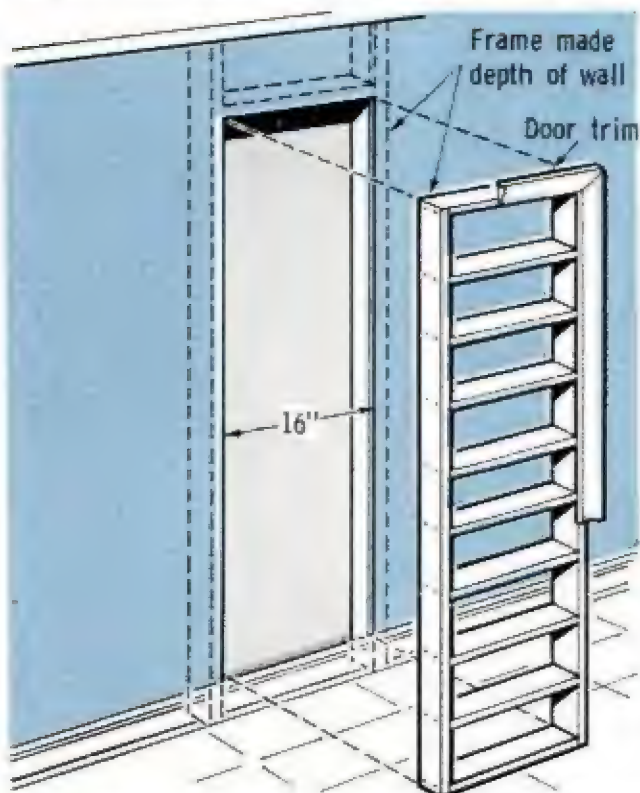
2 WASHER STALL. Stumped for a place to park a portable clothes washer in the kitchen? Here's a clever answer if you can afford to sacrifice a little cupboard space. You simply form a stall for it under the counter by removing a portion of your base cabinet. When parked, the washer looks like any other built-in appliance. Same idea is adaptable to a roll-around kitchen appliance cart. When it's parked, a dummy drawer front and matching finish makes the cart blend in and look like the rest of the cabinet, with no one being the wiser. Pulled out, it makes a handy caddy for a toaster, mixer or coffee maker at table-side



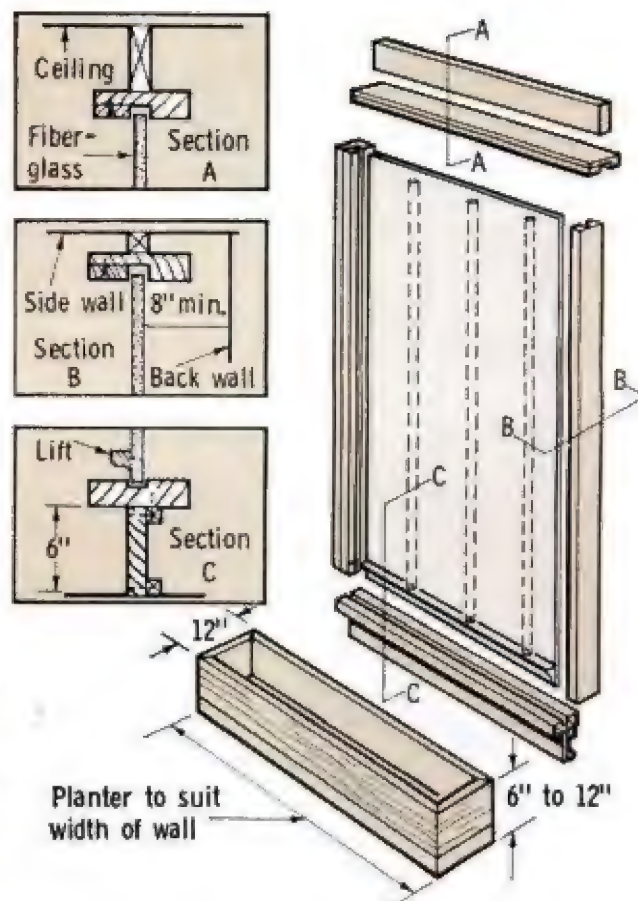
3 PLANTERS BY THE DOZEN. King-size patio planters cost a pretty penny, but not when you cast your own. Once the mold is made, you can cast as many as you want, using convenient bag mixes that need only water added. In filling the mold be sure to spade the mix well so it will be dense and without voids. Brushing a light coating of grease on the mold will keep it from sticking. Cure the finished planter by keeping it moist for five days or so by sprinkling occasionally with water. The longer concrete is kept moist, the more durable it will be. Keeping it from drying out too quickly by covering with burlap or straw is the thing to remember



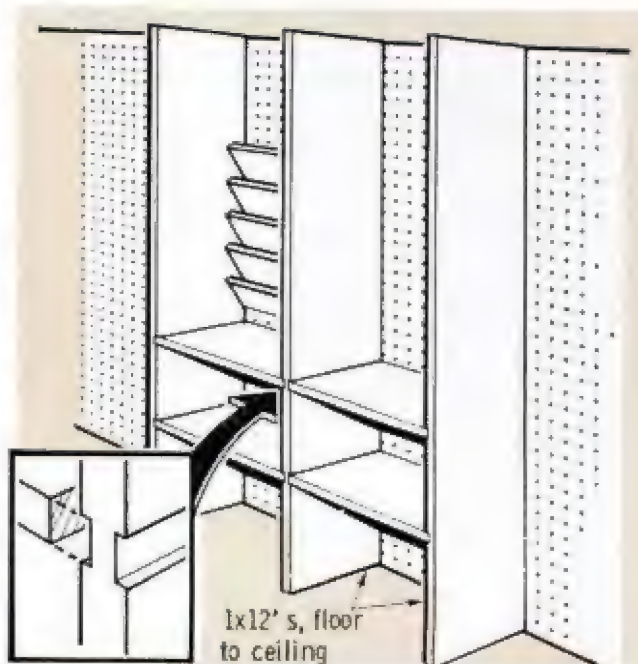
4 **SHORTCUT TO TOOL STORAGE.** It's downright silly to have to walk clear around to the garage each time that you want a garden tool—especially when this step-saving storage closet can be made to open up directly from the yard. Framing it of 2 x 4s as shown in the drawing and then lining it with Peg-Board is all there's to it other than cutting a doorway through the garage wall from the outside. Made large enough and fitted with a ramp, such a closet makes it extra convenient to park heavy yard equipment. The perforated-hardboard lining makes it easy to hang all kinds of garden tools in neat and convenient array



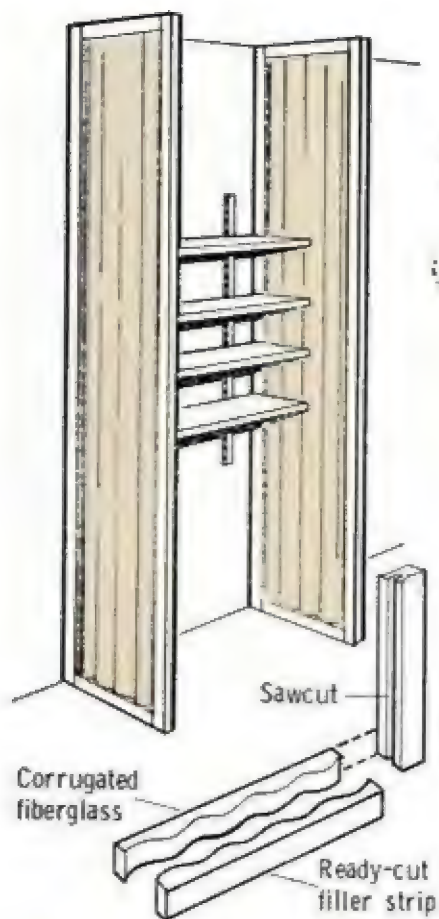
5 **SPACE A-WASTING.** Believe it or not, there's space going to waste in the walls of your house. This is especially true in your kitchen since the hollow space between the studs affords ideal storage for canned goods. What's more, with the cans on shelves of one-can depth, you can see every can at a glance with supermarket efficiency. All it takes is a shallow, backless cabinet fitted with plenty of shelves and a stock-size louver door which is made to fit a niche cut between two studs. Door trim mitered at the corners, is used to cover the rough opening, and a common magnetic catch holds the louvered door shut



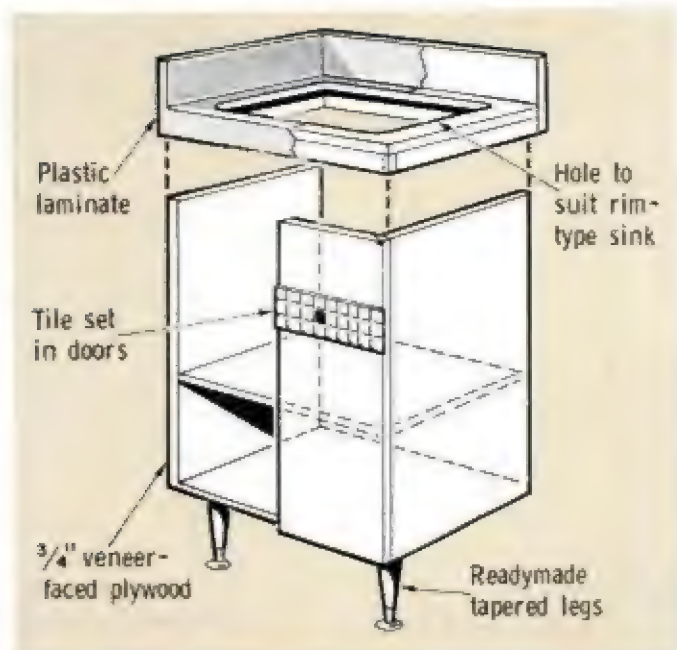
6 LET THERE BE LIGHT. Next best thing to an actual window at the end of a dark hallway is this smart illuminated panel and planter. Dramatic looking both day and night, it combines a touch of greenery against a backdrop of a floor-to-ceiling fixture. A panel of white translucent Filon hides a bank of fluorescent lamps fastened directly to the wall. Removable molding holds the fiberglass panel, to let you get at the lamps. The matching wooden planter box, filled with plastic plants, is separate from the rest. In studying section details A and B you'll note there are filler strips indicated, called scribing members, which are marked and cut to conform to any irregularities that there may be in walls and ceiling. Main purpose of the strips is to prevent light leakage around the edges of the frame supporting the plastic diffuser



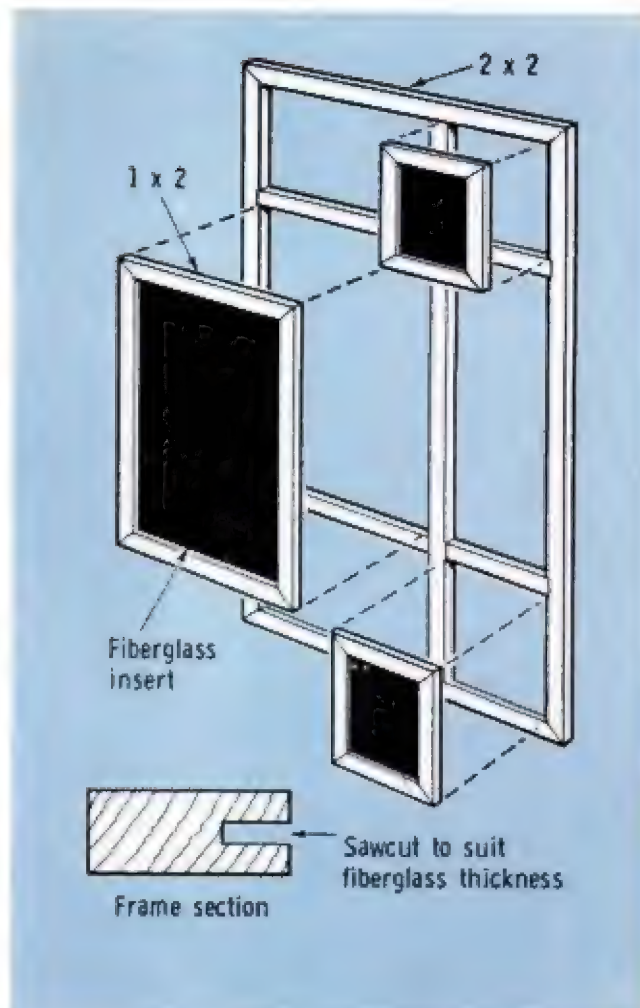
7 SHELVES APLENTY. To solve that never-ending need for more shelf space to hold books and magazines in a family room, this unit stands against a wall of perforated hardboard to double its capacity. A divider-type affair of wide (1 x 12) boards, it creates shelves and niches across the wall. Since the niches thus have perforated backs, countless additional shelves and hooks can be used to give unlimited display. Slanting dividers between the uprights make for easy magazine selection. The detail shows how dados in the vertical members permit the shelves to be joined and cross-aligned in assembling and gluing the unit together



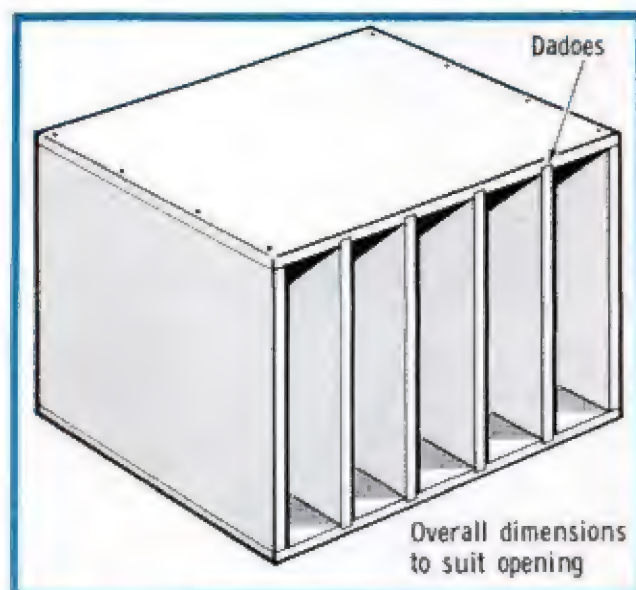
8 TOWELS OVER THE JOHN. You'll be making the most of space in a small bathroom with this attractive towel rack that stands over the toilet tank. Not only is it a clever idea for making use of waste space, but the open rack lets a group of towels add a bright spot of color while they're waiting to be used. Rack sides are of tinted corrugated fiberglass set in narrow floor-to-ceiling frames. Regular standards and adjustable brackets are used to support the shelves



9 VANITY CONVERSION. Another way of gaining space in a tiny bathroom is to convert a leg-supported washbowl to a vanity. Little more than a cabinet, it does offer additional storage for such bathroom essentials as bowl cleansers, tissue. Matching wall tiles set flush in the door give the vanity a custom look



10 SEE-THROUGH DIVIDER. A room divider that's different indeed, this beauty features separate inserts of patterned fiberglass that resembles stained glass. Left open in a staggered see-through pattern, it can create a small hallway without reducing the overall spacious feeling of the room itself. The basic framework is a simple grid design constructed of 2 x 2s. Separate frames of 1 x 2s, grooved to house the fiberglass, are made to fit inside the openings in the grid frame. Half-lapped joints are used where members cross, while corners of both main grid frame and the inserts are mitered

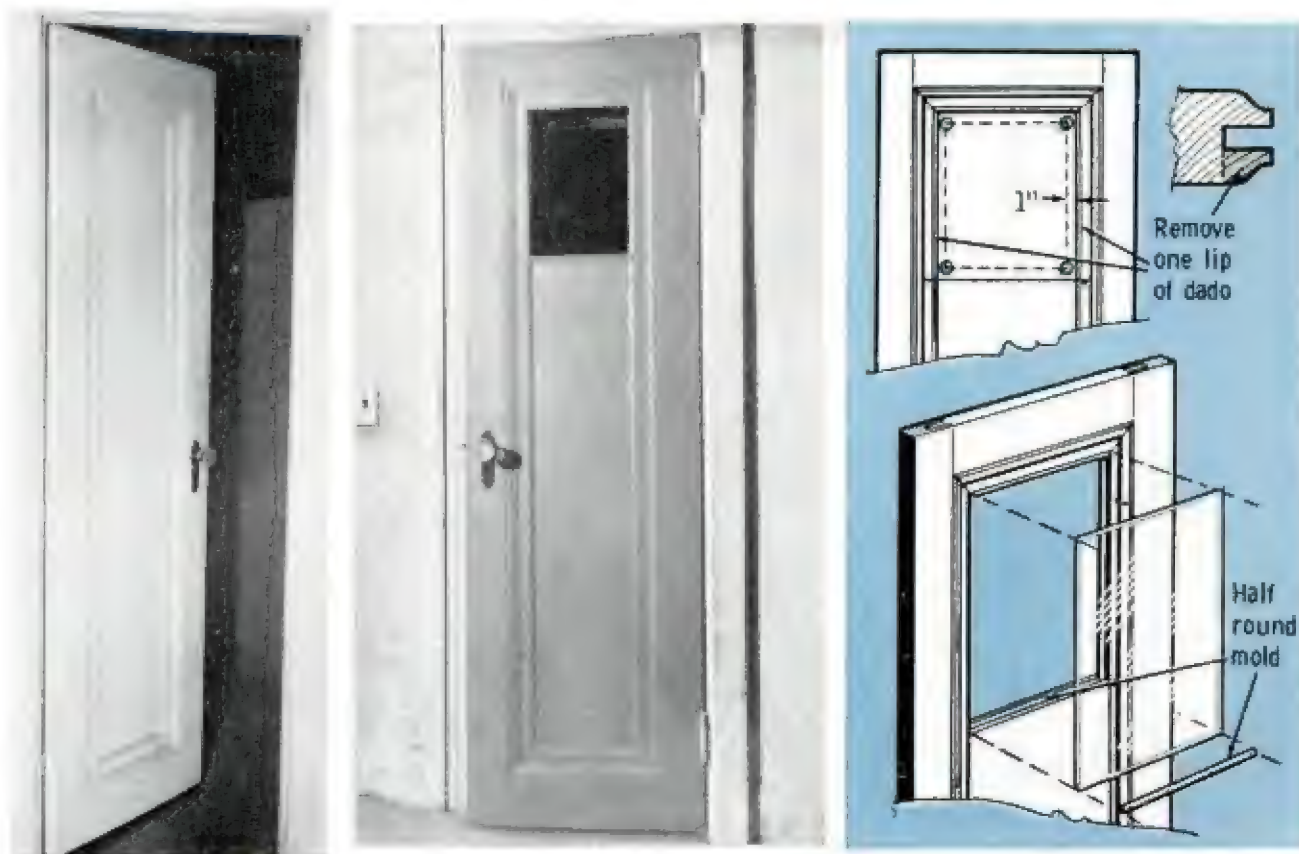


11 ORDERLY STORAGE FOR TRAYS. How and where do you stash such hard-to-store things as serving trays, cookie sheets and similar slim-jim items? On edge and in narrow pigeon holes is perhaps the best answer as to how, and in a section of a pan cupboard is one version of where. Here a portion of the center shelf will have to be sawed off to accommodate a separate slip-in unit which you make to fit. Shallow dadoes in top and bottom members will add rigidity when the parts are assembled with nails and glue. It's easier to paint the dividers, as well as the top and bottom parts, before gluing in the dadoes



Home is what you make it!

Adding a window to a panel door



SOMETIMES IT'S HANDY to have a glass-paneled door in the house. In the project shown, for instance, the door led into a laundry room and was normally kept closed. With a window added, however, the wife could glance in and see whether the washer was ready for another load. Also, the glass panel let in quite a bit of extra light.

Installing the window involved nothing more than replacing a portion of the wood panel with a pane of glass. The section of wood panel was removed by drill-

ing starter holes 1 in. in from each corner and sawing out the center section, then making a saw cut into each corner so that the four remaining strips could be pulled out of the dados.

The top edge of the pane was bedded in putty in the regular panel dado at the top of the door. One lip of each side dado was removed with a sharp wood chisel so the glass could be slipped into place. Glazier's points and putty were used to hold it. Half-round molding was added at the bottom to act as retainer strips.

Suction cup increases versatility of your steel tape

It's difficult to get an accurate measurement with a steel tape if you can't anchor the end by hooking it over an edge. A suction cup bolted to the end of the tape does away with such difficulties, making it easy to take measurements off a flat wall surface, either vertical or horizontal. Just drill a hole in the tape to fit the bolt in the suction cup, and keep the suction cup handy in your tool chest.—Ken Patterson





Home is what you make it!



Give your wife a break

Here are two step-saving work centers, one a multipurpose kitchen laundry wall, the other a complete dress-making shop in a cabinet, to make housework easier for her

1. Kitchen laundry wall

By Hank Clark

IT MAKES SO MUCH SENSE to locate the home laundry in the kitchen that I'm surprised more people haven't done so. Modern washers and dryers are as smartly styled as any stove or refrigerator, and most of them are whisper-quiet. But the strongest argument is convenience—no more running up and down those basement stairs.

I installed our washer and dryer in the space originally planned to hold a dinette set. (We now eat all our meals in the dining room). The one problem was finding a place to store all those laundry necessities—soap, bleach, a sorting hamper for dirty clothes, and the rest

of it—but I had already planned a solution for this.

Special-purpose cabinets above and on either side of the washer and dryer provided plenty of storage space for all of these things. There was even some extra shelf space to take the overflow from other kitchen cabinets. Since all the cabinets were styled to match the kitchen decor and dimensioned to fill the available space, the whole thing ended up looking like an efficient built-in laundry center which might well have been a part of the original kitchen plan.

Now that it's finished, I can see that this laundry wall could just as well be

BROOM CLOSET at the end of the laundry wall holds the vacuum cleaner, floor polisher and even a broom



DOUBLE HAMPER features partitioned bottom section for sorting clothes. Top is for unironed laundry





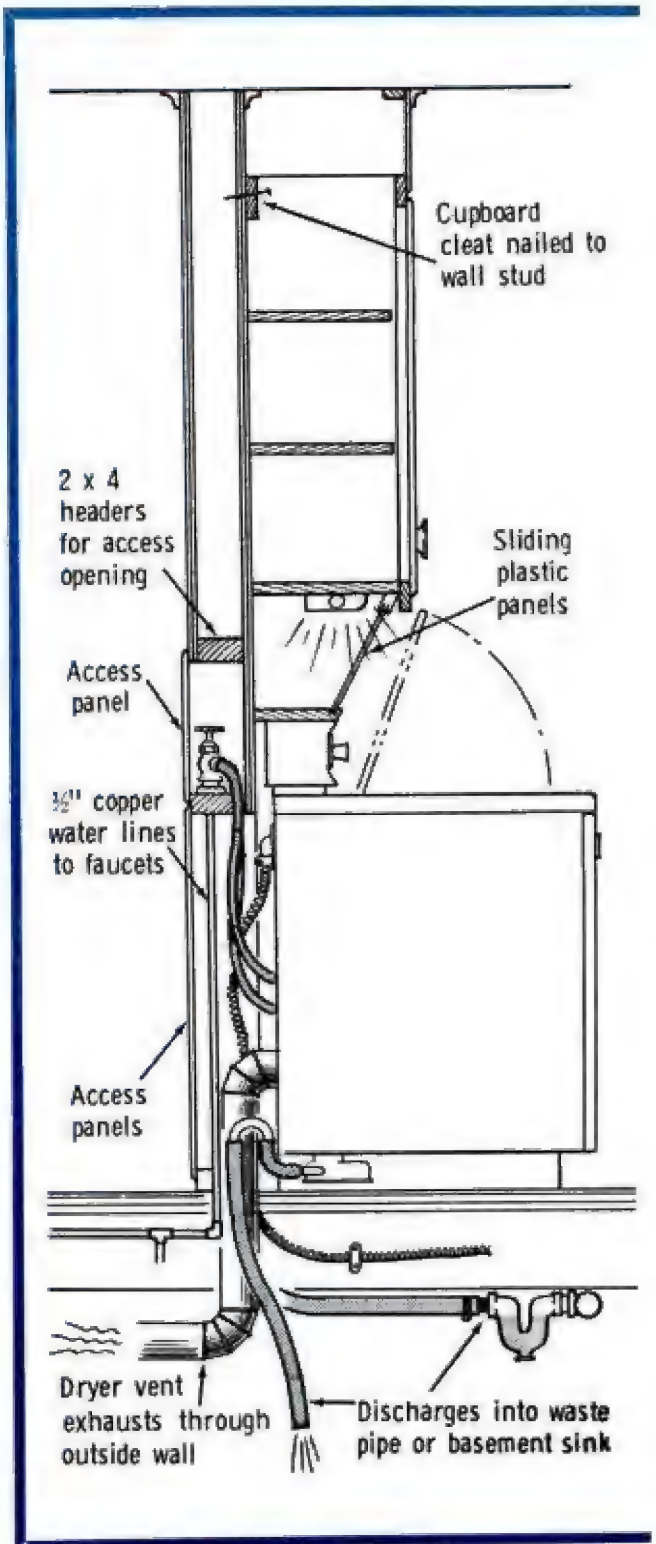
KITCHEN DESK above hamper has plenty of pigeon-holes for household accounts and correspondence



END CABINET is a handy place to store detergents and bleaches. It's located right next to the washer



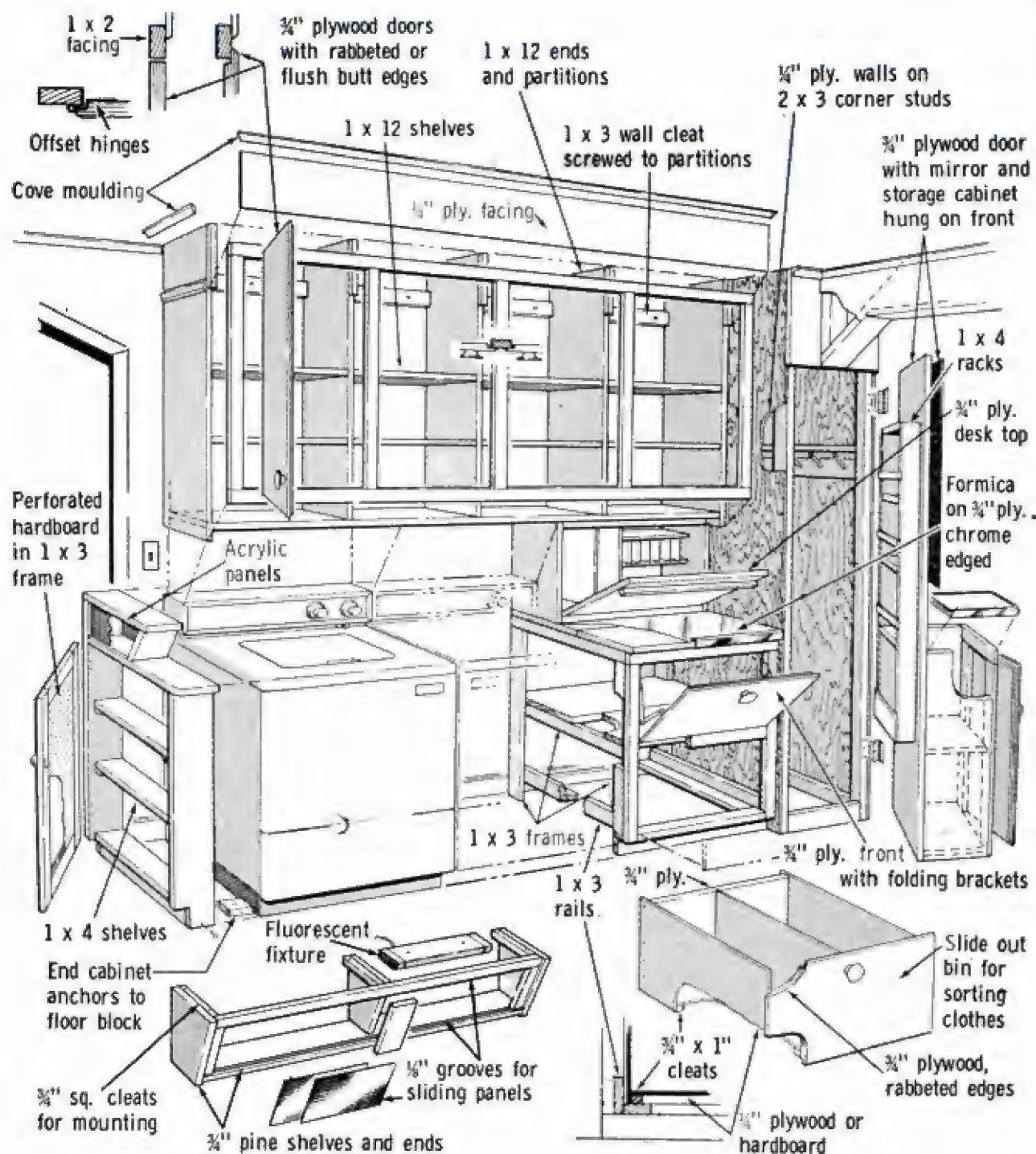
COOKBOOK SHELVES have sliding doors of opaque plastic to diffuse light from fluorescent fixtures inside



built as an island divider wall or a partition with one end against a regular wall to form an alcove. It depends on your floor plan.

The only real requirement is access to the laundry lifelines—hot and cold water for the washer, a drain line to a trap, a 20-amp outlet to plug in the washer, a 50-amp circuit to the dryer (or a gas line, if you have a gas dryer) and an outside exhaust duct for the dryer.

The water lines should have shut-off valves at the outlets, since washer manufacturers recommend that the water be

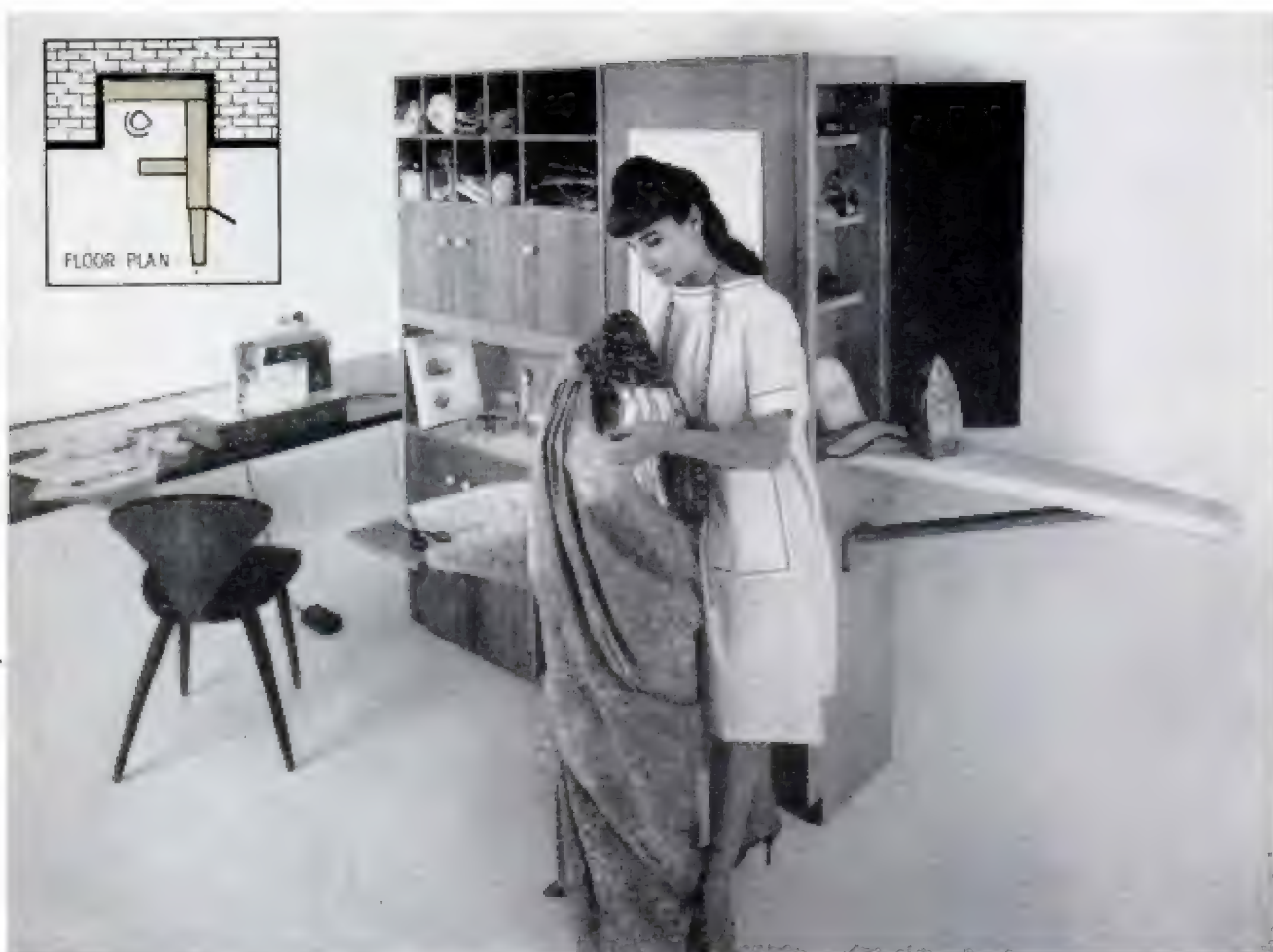


shut off between loads to take pressure off the hoses. I installed an access panel in the opposite side of the wall from the laundry center for this purpose.

All building codes require a trap in the drainage line to prevent sewer odors from backing up. Instead of installing a separate drain with a trap, I led a hose down through the floor to our unfinished basement so that the washer would drain into a stationary laundry tub which is equipped with a trap, so it's all legal.

The plans for the cabinetry are self-

explanatory, with exact dimensions being determined by the space available. Bear in mind, though, that most washers are top-loading so the bottom of the wall cabinet above should be high enough to allow the lid to swing up. Shallow cookbook cupboards with inclined sliding doors of translucent plastic fill this space nicely without obstructing the lid. Fluorescent fixtures mounted in the top of these cupboards and wired to a wall switch, provide plenty of light directly over the washer and dryer where it's needed.



DESIGNED TO FIT the alcove of a dormer (see inset), sewing center makes full use of light from window

2. Dormer sewing center

HAS YOUR WIFE'S SEWING gradually outgrown the sewing-basket stage? If her sewing paraphernalia is now scattered all over the house, here's a welcome solution designed by *PM* and built for us by Simpson Timber Co. that will organize everything in one place.

Basically, it's just a compact free-standing cabinet equipped with a number of special-purpose storage compartments and a spacious worktable. And while it could be used anywhere, it was originally designed to suit a rather unusual situation in which the only possible location for a sewing area proved to be in a large double-windowed dormer at one end of the master bedroom. While the lighting situation was ideal, potential storage space seemed quite limited.

To take full advantage of the light, a spacious worktable was installed in the dormer directly under the windows. It rested on cleats secured to the wall.

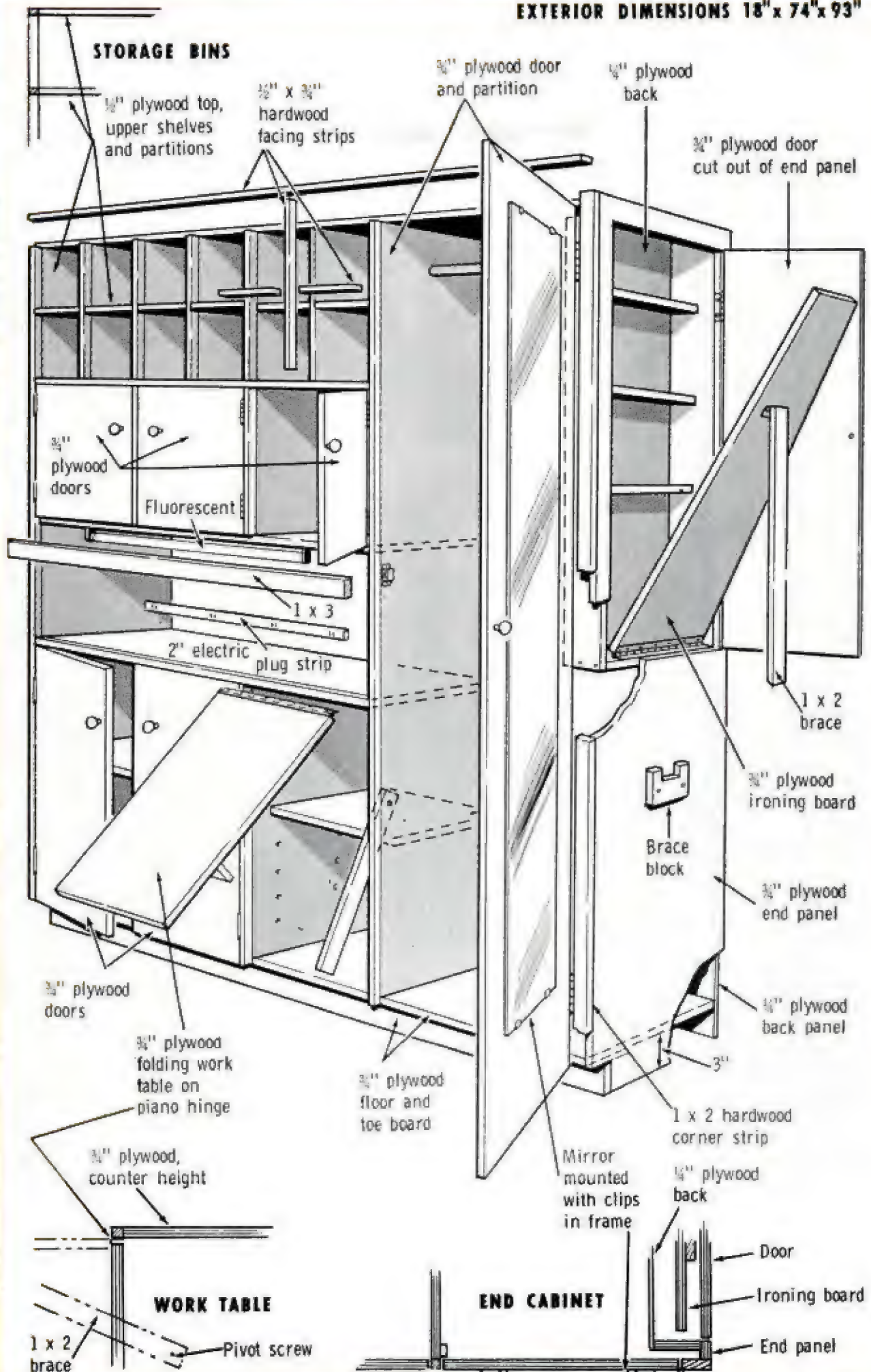
Providing adequate storage space seemed to be an almost impossible problem at first glance. The dormer was too narrow to ac-

commodate storage cabinets on both walls, and the slanting roofline made it impractical to locate cabinets along both sides.

The solution was actually quite simple—a single large cabinet along one wall of the dormer extending out into the room to partition off that corner and turn it into a sewing alcove. Designed specifically for this storage job, the cabinet's an ingenious combination of different-sized bins and shelves to hold all; everything from buttons to sewing-machine attachments. In addition, it includes a miniature swing-down ironing board, a swing-up work table and a closet for partially finished garments and a dress form. A full-length mirror on the door of the closet makes it easy to check hems and proper fit.

Of course, the worktable and storage cabinet could be located anywhere in the house, either as an L-shaped unit in a corner or with the end of the cabinet against a wall to partition off a sewing corner. By adding legs to the worktable, the two units can be made independent of each other and arranged to suit your floor plan.

EXTERIOR DIMENSIONS 18"x 74"x 93"





Swing-down cupboards

STRETCHING may be good for your wife's figure, but hardly safe when reaching for a dish on the top shelf of a kitchen cabinet. Standing on a chair isn't recommended either.

You'll have greater peace of mind if you build her cupboards fitted with "Magic Shelf" and send her off to the YWCA for her exercise. Magic Shelf is a spring-controlled set of brackets for a cupboard within a cabinet that permits pulling the cupboard down to you. It's distributed by Functional Designs, Inc., 609 Fifth Ave., New York, N.Y. 10017, for \$10.

You can use your existing cabinet merely to make access to the upper shelves easier, or you can rebuild it to the ceiling, adding to your storage space

by eliminating the soffit above. Dimensions are not given, since every kitchen will have different ceiling heights and cabinet widths. All material except cabinet backs is $\frac{3}{4}$ -in. plywood. The backs can be made from $\frac{1}{4}$ or $\frac{3}{8}$ -in. plywood, rabbeted or lapped.

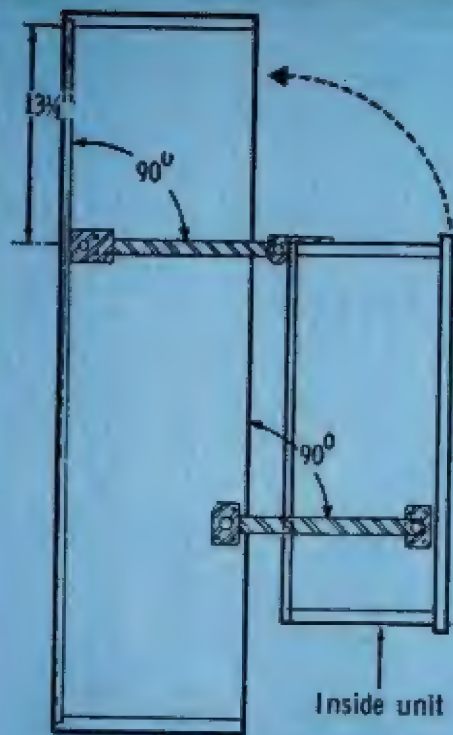
The inner cabinet is made with the clearances shown on the opposite page. It will be one shelf shorter than the outer cabinet to allow for attaching the bottom brackets and to permit the easily reached bottom of the outer cabinet to serve as another shelf.

The upper brackets are affixed to the outer cabinet so their upper parts clear the cabinet top. The lower brackets are attached near the bottom and to the sides of the inner cabinet.—*Bill Baker*



CABINETS IN POSITION (above) make a neat installation. The $1\frac{1}{4}$ -in. cupboard frame conceals most of the brackets. Even a short person has no trouble in reaching the top shelf when the cupboard is swung down (right)





SIDE SECTION

All exposed edges covered with matching veneer tape

All 3/4" plywood

1 1/4" front frame

Magnetic catches

Matching veneer tape

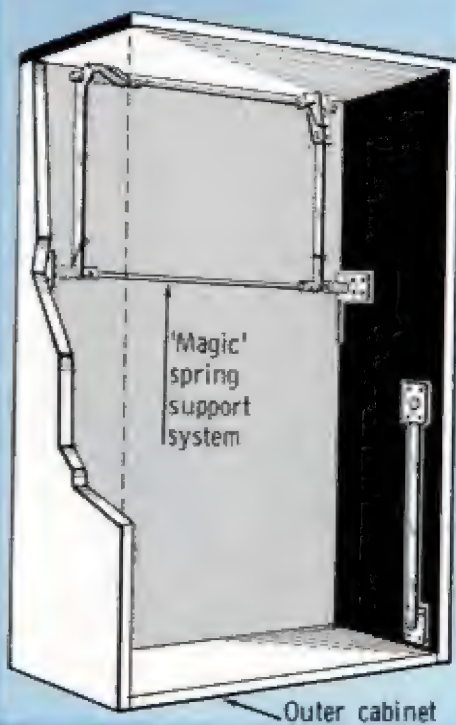
Inside unit

Piano hinge

Support bracket

Lock

BRACKET MOUNTING



Outer cabinet

Inner cabinet

BRACKET ASSEMBLY

Short rod for inner cabinet

Long rod for outer cabinet

Second step of assembly

Inner cabinet mounting bracket

First step of assembly

This rod to be cut to outer cabinet inside width

Final assembly of bracket

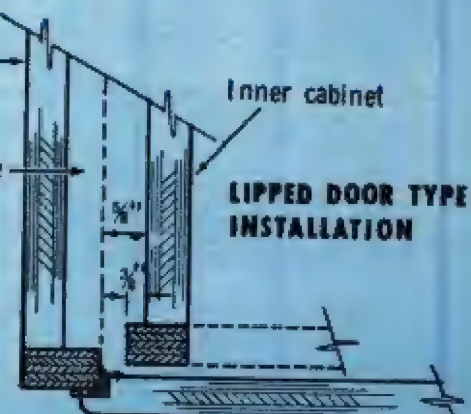
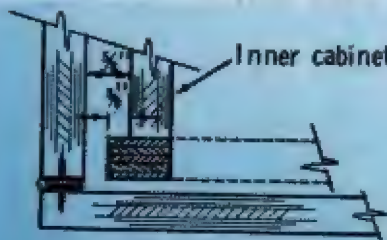
Bracket mounting space

Outer cabinet

Inner cabinet

LIPPED DOOR TYPE INSTALLATION

LAPPED DOOR INSTALLATION





Home is what you make it!

Exciting new products for home remodeling

'Things are seldom what they seem' in the new crop of materials — aluminum shingles that look like wood... vinyl that passes for tile... metal 'wood' beams — and more!

By Richard Howe

IN CASE YOU HADN'T NOTICED, a greater variety and selection of fabulous new home-improvement products is flowing into the market today than ever before in history. Henry Homeowner will be hard put to dream up something that isn't already inventoried at his local hardware or lumber dealer. The cornucopia of American industry has anticipated and fulfilled just about every need a do-it-yourself home buff could have.

Space limitations permit us to describe only a handful of the many new products available to the public this year; but their very diversity will give you some idea of the wide range of needs they meet.

Item—you can have a shower floor to match the tile floors and walls of your bathroom, thanks to Surfline shower re-

ceptors of Duramold by American Radiator & Standard Sanitary Corp.

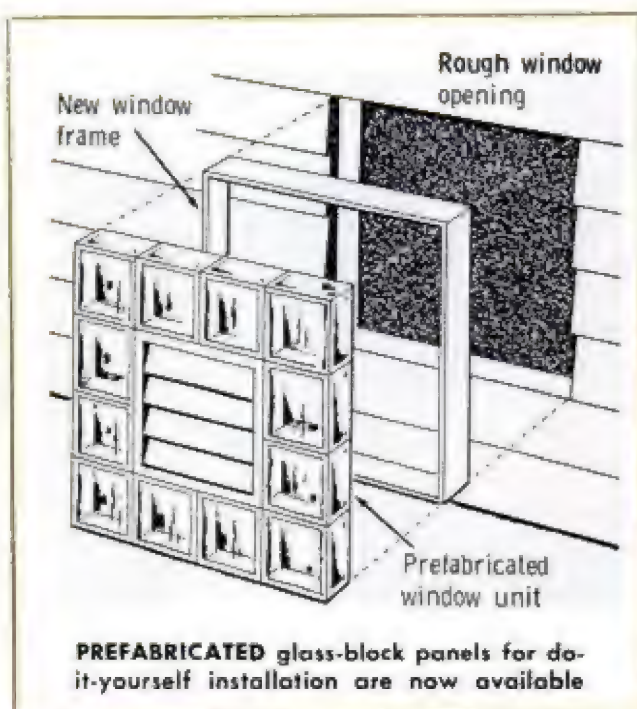
Item—The Armstrong Cork Co. offers a Cambrian Vinyl Corlon sheet flooring material that combines a foamed vinyl cushion backing with a new nubby surface texture. Treading its cushiony, quiet surface is very like "walking on air."

Item—In the market for shutters? You can get them in rotproof nylon that's indistinguishable from fine woodwork. Their factory-applied finish doesn't require painting for years. A Du Pont product, they install with a hidden fastener.

Item—Low-budget hardwood wall paneling is an entry from Georgia-Pacific Corp. It features a solid clear vinyl sheet bonded to a wood-grained surface. Plywood veneers include Philippine lauan



TRANSLUCENT GLASS-BLOCK WALL features hour-glass and oval pattern. Steel reinforcing strips were inserted in mortar joints to add strength to the wall



PREFABRICATED glass-block panels for do-it-yourself installation are now available



THIS IS THE SPIRA-STAIR. Suspended from a structural steel ring assembly, it is independent of walls for support. Spacing of gold anodized aluminum tubes eliminates need for handrail

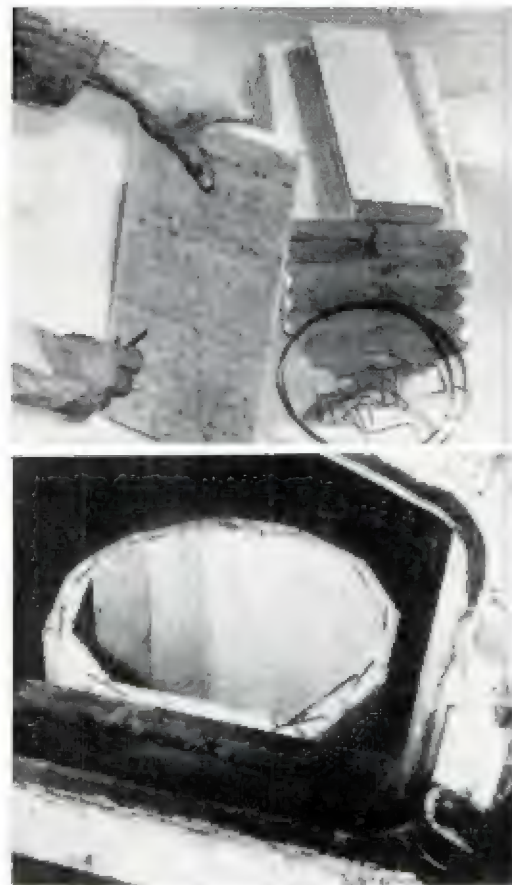
hardwood, "iced teak," walnut pecan and natural teak or oak. They're 4x8-ft. panels, $\frac{3}{16}$ -in. thick with embossed grooves striped to simulate real hardwood lumber.

Item—Johns-Manville offers lightweight fiberglass lay-in acoustical panels which are washable and fire-resistant. Their embossed white surface in an overall pattern will lend a soft, decorative note to the decor of any room. One inch thick, the panels

METAL CEILING BEAMS with wood-grain finish offer a fast way to update a ceiling. Costing much less than wood beams, they can be installed in an afternoon



SEPTEMBER 1966



A MOUTHFUL OF A NAME, but a furnace-full of heat—that's the Cera-Farm Combustion Chamber Replacement Kit for oil-burning furnaces. Unit saves fuel, contributes to quiet operation and assembles in minutes

are available in 2x2 and 2x4-ft. sizes.

Then there are new fiberglass wall panels from Owens-Corning Fiberglas Corp. that combine thermal and acoustical insulation with a washable vinyl surface . . . Lock-Deck decking by Potlatch Forests, Inc., in nine prefinished pastel colors and five softwood species that install without drilling or the need for special fasteners . . . Sierra Sawn siding of prefinished

WOOD IT AIN'T (it's aluminum). This eye-fooling Rustic Shingle can be installed directly over existing roofing or siding; it weighs only 50 lbs. per square



129

redwood by Simpson Timber Co. which is available in a choice of colors . . . A dramatic one-piece fiberglass tub-and-shower unit that is easy and economical to install (Universal-Rundle Corp.) . . . Weyerhaeuser's new Prefinished Soffit/ Series S-10—an exterior plywood panel with a baked-on, reinforced, white acrylic finish guaranteed for 10 years . . . and (like the man says), scores of other fascinating home-beautifying goodies too numerous to mention.

Take glass brick. Designers at Pittsburgh Corning Corp. have given some really exciting new shapes and dimensions to this long-established building product. You can still get the traditional waffle-textured, translucent block that has enjoyed such popularity over the years, but now you can also select from a variety of colored block to match the trim of your house; or blocks that look like cement units with glass portholes for installation as windows and entry panels.

A highly original effect can be achieved in home, office or den with a whole wall of

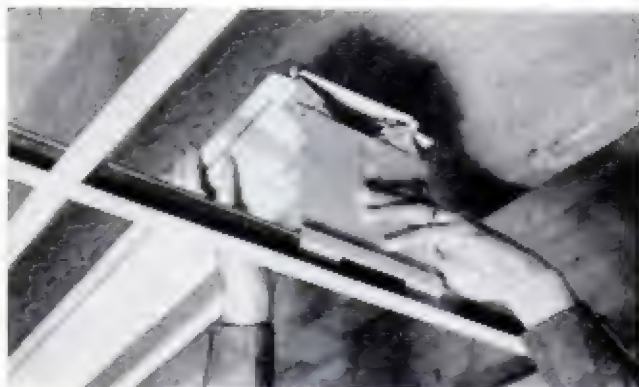
decorative glass masonry. The installation shown on page 128 was accomplished by tearing out the existing wall, framing the opening, then constructing a new wall of glass brick having an hour-glass and oval pattern (just two of many patterns now available). Sunlight streams through the wall by day, yet the bricks provide the same privacy as would an opaque wall. Translucency, privacy, beauty—a hard combination to beat in a price range most homeowners can span.

You don't have to be a lighthouse-keeper to appreciate the advantages—artistic and practical—of Spira-Stairs, a spiral staircase that flows with the warmth of wood and gold tones. Spira-Stair is suspended from a structural steel ring assembly that makes it independent of walls for side support. Its direction can be clockwise or counterclockwise. The ample oak treads are supported by gold anodized aluminum tubes anchored to the ring and to the oak treads. Tubes are so spaced that no handrail is needed. Each stair comes with all necessary attachment hardware.

Recessed lighting is available to any handyman with a yen for it—and a few hand tools. The basic installation steps required to carry out this home-improvement project are shown in photos below



TWO MOUNTING BRACKETS secure Armstrong Grid-mate-unit in place after completion of suspended ceiling grid. Pressure screws secure brackets to the grids



FLUORESCENT FIXTURE is then attached to mounting brackets by means of two sliding tabs at its ends which are simply bent over slots in the brackets



NEXT, REFLECTOR PANELS are attached to the top of the fixture. These provide a highly reflective surface which distributes light evenly throughout room



FINAL STEP is to insert the fluorescent tubes, plug the unit into an electrical outlet, then place a luminous panel into the grid beneath the fixture

This beautiful installation is a product of Pease Woodwork Co., Hamilton, Ohio. Prices start at \$495.

Homeowners who heat with oil—hearken to this! How would you like to cut your heat bill 25 to 30 percent, at the same time eliminating much of the soot, smell and noise often associated with oil heating? Well, there's a little item called the Cera-Form Combustion Chamber Replacement Kit, made by Johns-Manville, that can be installed by the average homeowner in about an hour at a cost of \$14. A real fuel-saver, the kit installs right inside the old firebox of your furnace. When the oil-burner goes on, the Cera-Form heats instantly to incandescence, thus eliminating the warm-up period which is usually the most costly part of the oil-burning cycle.

Installation is easy. The floor of the combustion chamber is covered with the floor panels furnished with the kit. The sections are nested together so that their grooved edges interlock. A hole is then cut into the wider front panel to accommodate the oil-burner blast tube. The rest of the chamber is then stapled together according to instructions accompanying the kit. Finally, the unit is firmly held in place with a stainless-steel band that is wrapped around the chamber's outside walls, then tightened in place. Noise reduction during

operation will be noticeable immediately. The kit is available from most oil-supply dealers, or directly from Johns-Manville.

The mushrooming popularity of metal ceiling beams with wood-grain finish is proving slightly sensational these days. Their appearance is that of expensive walnut box beams. Their installation time is a single afternoon. The tools required are a hacksaw, and a screwdriver or hammer. They attach to any kind of existing ceiling. Best of all, they cost a pocketful less than genuine wood beams, yet an eagle-eyed termite couldn't tell they weren't the real McCoy—until he tried to chew one.

Installing the lightweight beams is simply a matter of screwing or nailing special clips at 4-ft. intervals to the existing ceiling. The beams are then snapped into place over the clips. Special 2-in. end pieces are included to abut the walls, and splicers are available to extend the beams to fit any size room. An additional design feature can be achieved by installing cross beams at appropriate locations.

Celotex Corp. of Tampa, Fla., makes these beauties in 4 and 12-ft. lengths. They measure 2½x3 in. Prices are \$2 for a 4-ft. beam, \$3 for a 6-ft. beam.

If a rose is a rose is a rose, is an aluminum shingle a hand-split wood shake?

(Please turn to page 184)



NEW VINYL SIDING IN A 6-IN. WIDTH duplicates colonial clapboard. It can be used as original or replacement siding. No special backerboard is needed, since it nails directly to sheathing. Siding has special nailing tabs that act as built-in springs which achieve a secure but "floating" suspension of each course of siding. Slotted nailing holes permit the siding to expand and contract during temperature changes



Beauty on a budget was PM's goal when we tackled the updating of an outmoded bathroom. We packed it full of modern accessories for your convenience

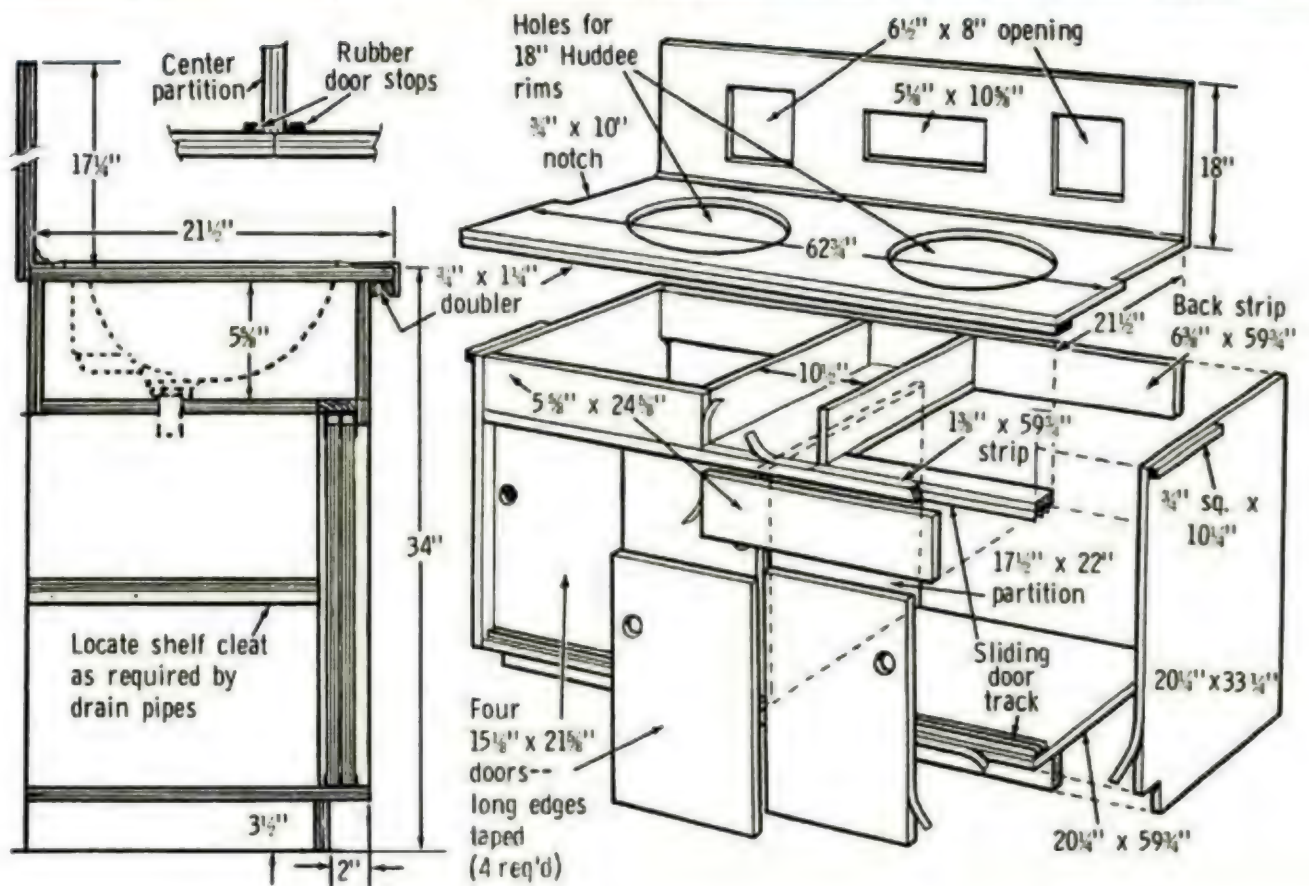
Deluxe bathroom for a modest home

By Al Lees, PM's Home Workshop Editor

What room in your home is the mood-setter? We'll wager it's your bathroom—the room that greets you in the morning and sends you off to bed. Small wonder, then, that many of us start and end the day glumly. Most bathrooms are cursed with clutter: The family toothbrushes bristle at you from exposed racks . . . the wife's lingerie droops soggily from the shower rod . . . and the general atmosphere is as chilly and antiseptic as a hospital.

What we wanted to create was a *cheerful* bathroom—one that exploited the warmth of natural wood and sunny colors, tucked unsightly necessities into the wall when they weren't in use, promised easy maintenance—and offered the do-it-yourselfer maximum opportunity to cut outside labor costs.

To keep our feet on the ground, we hunted up an actual bathroom in a family home—one that presented a grim challenge, as you can see from our

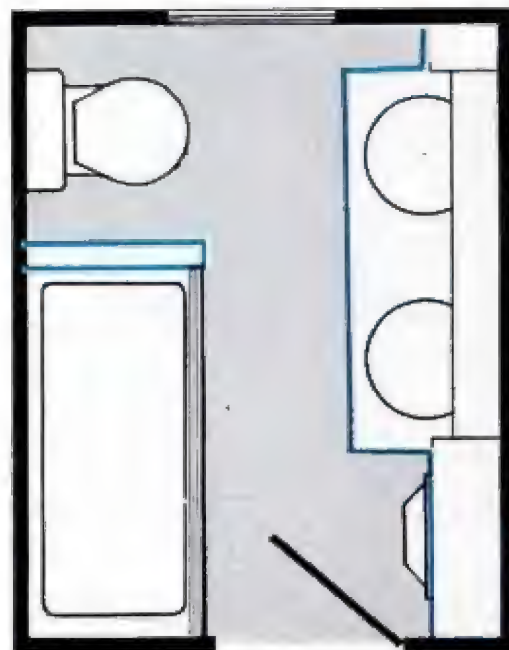


CUT,
FOLD,
TAPE

MODERN
BATHROOM

◀ From this to this ▶

FLOOR PLAN is basically unchanged in transformation of old bath at left to deluxe room at right, avoiding major plumbing revision. Color outlines on plan indicate new construction



“before” photo, above. Neglect and hard use from a succession of owners had left this bath the ugliest room in the house, with battered fixtures dating from an era that wasn’t noted for good design. An exposed radiator added another age wrinkle, as did a naked shower rod and a tiled backsplash with crumbling mortar that rendered the shower unusable.

We asked noted designer Franklyn Jacoby to give this room a major face lift, replacing the fixtures but keeping their present locations, to simplify plumbing. We then researched the accessories field to select a wealth of commercial units that could be built into our bathroom—including the retractable tub-alcove clothesline and let-down scale shown at left. These



TRIPLEX GLASS DOORS give generous access to tub, are easier to clean than shower curtains. Cleaning's easier, too, when vinyl flooring is covered up behind closet, without baseboard seam

TWIN LAVATORY permits double use of vanity during peak traffic at start and end of day. Recessed pivoting racks tuck toothbrushes, tumblers and soap behind chrome panels. Center panel dispenses tissue





EXTRA ACCENT of color and texture is provided by niche that nestles two guest towels between basins. Family towels are tucked through rings at either end, with spares behind sliding doors of cabinet. Recess under hamper stores foot-switch-operated shoe polisher when it's not in use

Photos by PM's Chief
Photographer Frank P. Fritz

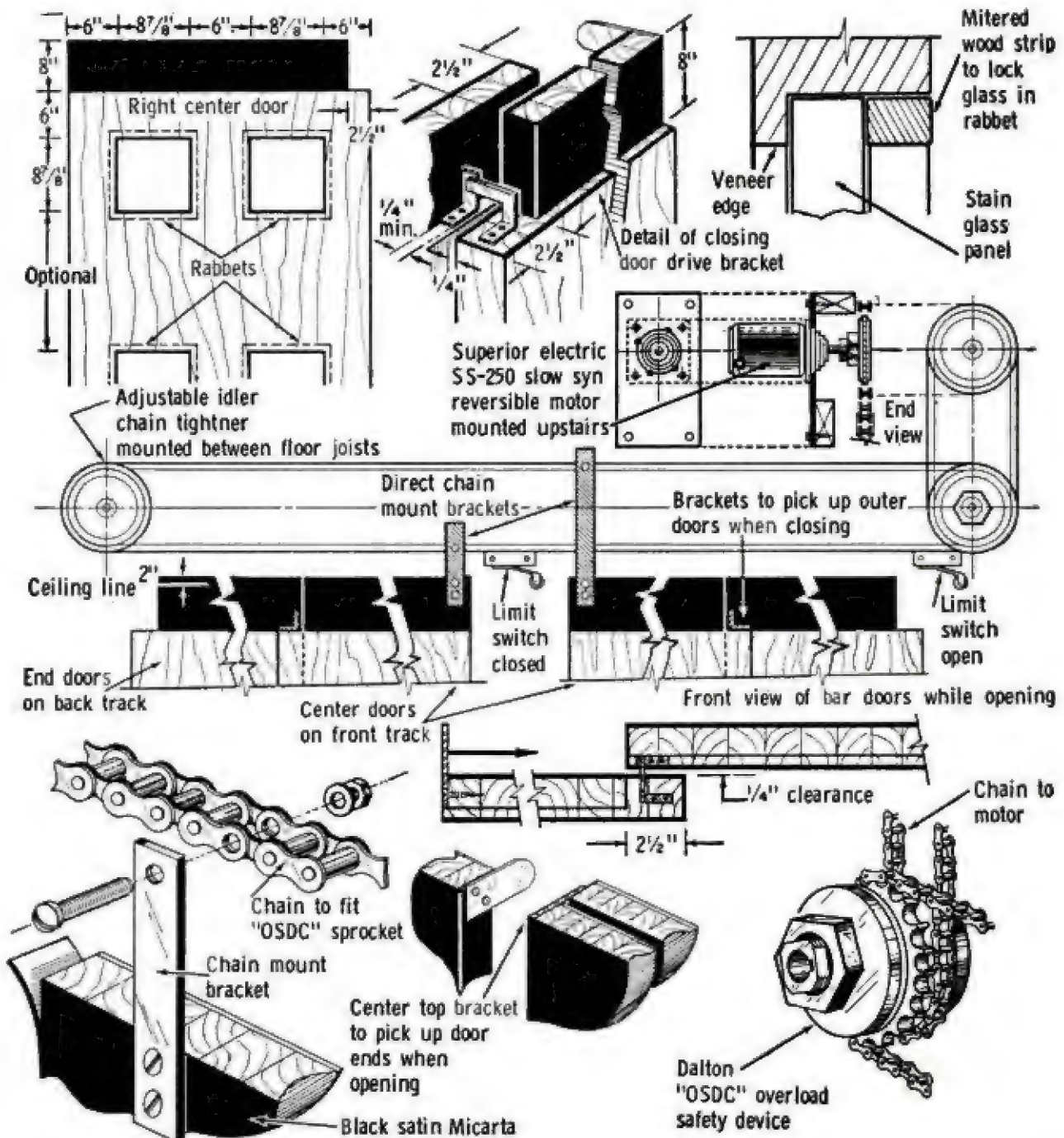


IDEAL SOLUTION for storing scale in bathroom with limited space: recess a hinged version between wall studs. When folded up, scale takes no floor space at all. At end of tub alcove, far left, is sleek chrome ladder for family's bath towels and—above it—reel for the retractable clothesline



CUTOUTS FOR GLASS INSERTS in two center panels of solid-core doors need cleats clamped to surface as template for routing grooves. Grooves become rabbets when cut along inner edge with sabre saw

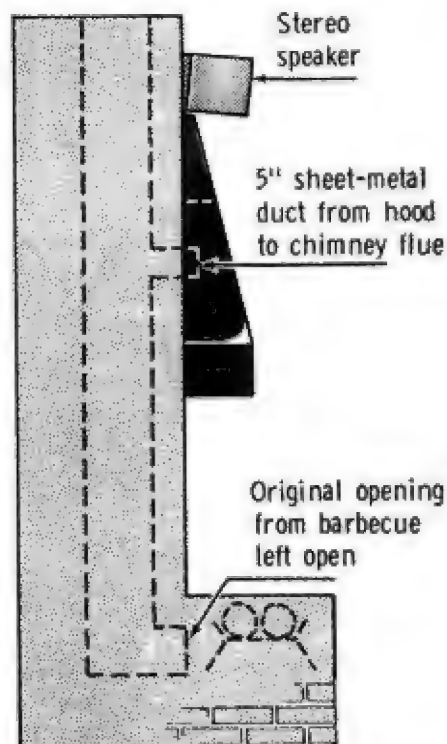
SPECIAL BRACKET hooks into drive chain and also engages adjacent non-driven panel to push it along heavy-duty track. Note black Micarta facing set into $\frac{1}{4}$ x8-in. rabbet around top end of doors





Home is what you make it!

Once a grill, now a fireplace



THE OUTDOORS becomes the indoors and a barbecue grill becomes a fireplace in this novel remodeling job. Rather than tear down an existing barbecue that stood back to back with an interior fireplace when adding a den and hi-fi room to my house, I converted it to a fireplace for the room.

The two fireplaces shared a chimney but had separate flues. All I had to do was convert its appearance and draw off smoke.

I removed some bricks from the chimney about 3 ft. above the grill and chiseled a 5-in. hole in the flue for a sheet-metal smoke pipe. Then I removed the grill and cut the front wall of the hearth back to the sides.

I sealed the brick, attached a large metal hood over the flue opening and placed a log rest in the hearth.

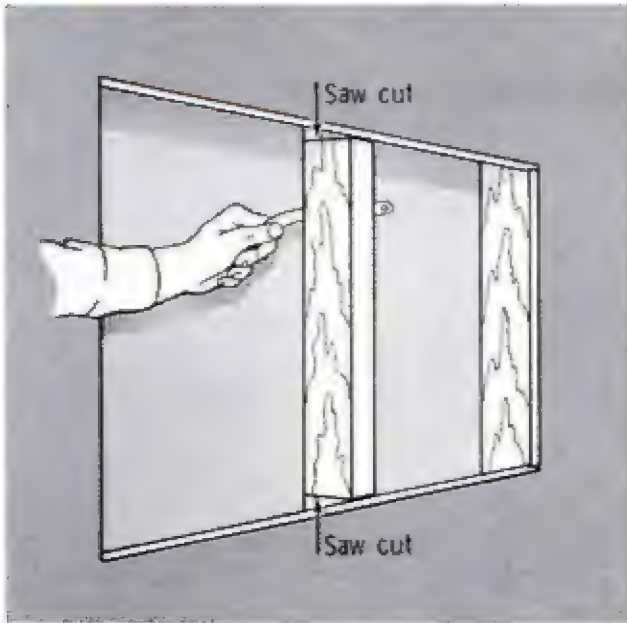
—Cliff L. Woolsey





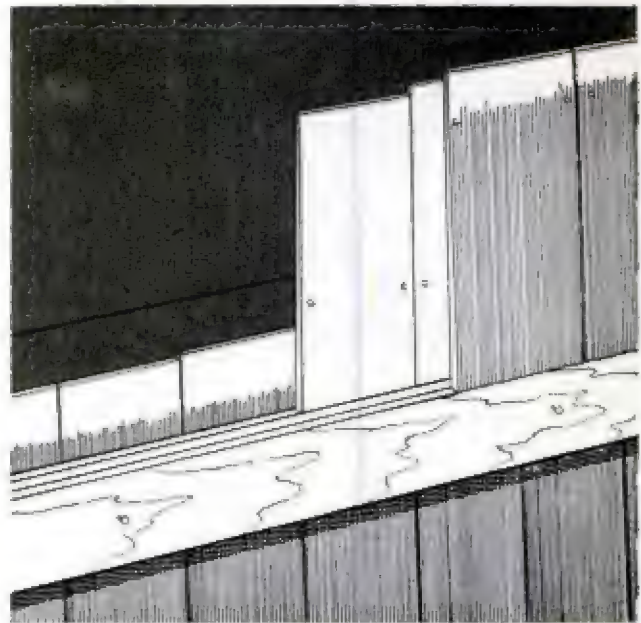
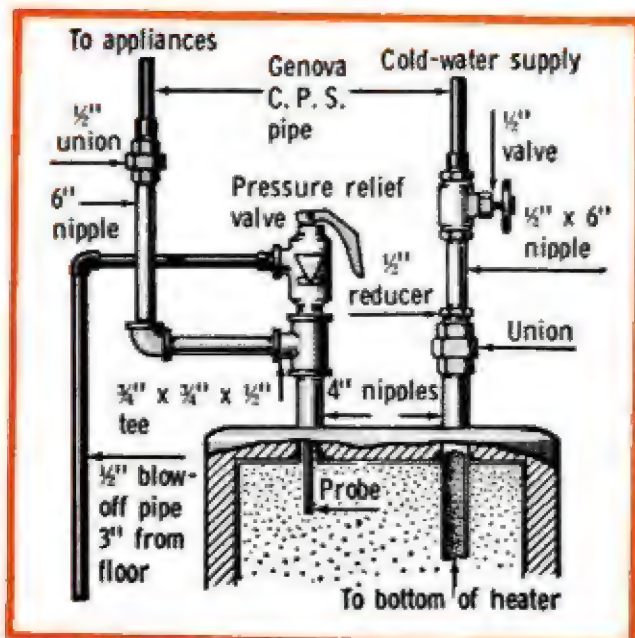
Home is what you make it!

Home handyman hints from PM readers



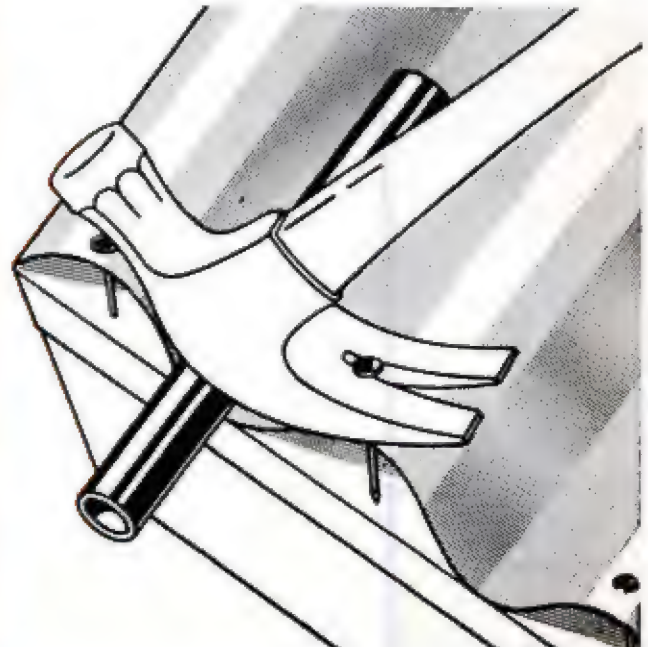
Cutting an opening for a flush medicine cabinet usually involves removing a short section of wall stud. Sawing it off at top and bottom is simple enough, but to pry it out will pull the lath nails with it and deface the opposite wall. You won't harm the wall if you work a hacksaw blade behind the stud and cut off the nails.

There'll be no question as to the correct way to install a domestic water heater when your old one gives out if you save and follow this basic diagram. Whether you use galvanized or Genova C.P.S. (plastic) pipe, you will have a safe installation that should satisfy code as well as water-heater manufacturers' requirements.



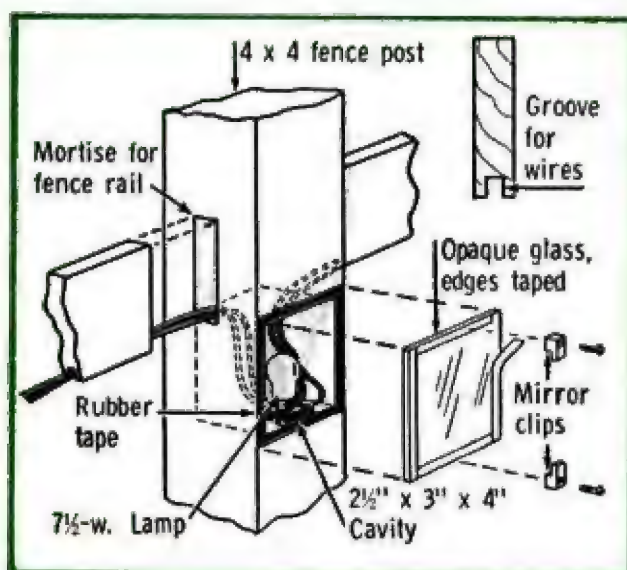
A length of common shiplap, with its rabbeted edge, makes an ideal straightedge when you apply double-course shingles. With the board tacked at right height for each new row, stand the inner-course shingles on very edge of the board, then place those of the outer course in the rabbet. The drip lap will be straight and uniform.

Next time you have to pull nails from corrugated roofing or siding, try this: Use a short length of pipe of suitable diameter as a fulcrum for the claw hammer. With pipe placed in a valley of the corrugation you will be able to get a straight pull on the nails. This trick will also help prevent the hammer from damaging the material.





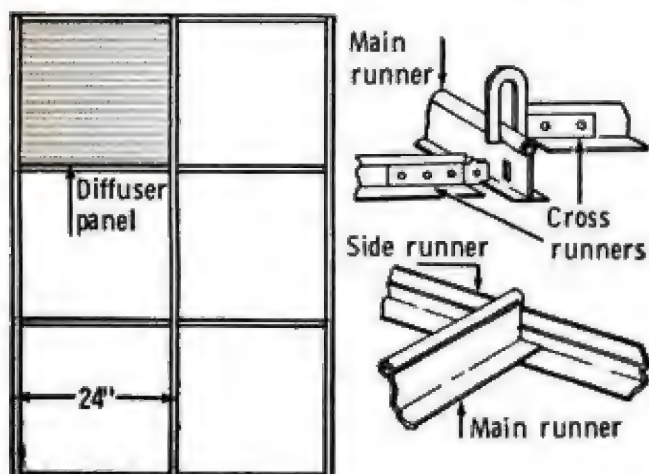
Fence "turns on" to light front walkway



"Just a fence" wasn't enough for Air Force Capt. Raymond Kuhlman of Belleville, Ill. Besides beauty and practicality, his fence had to provide illumination. So he built a basic post-and-rail fence with 3x4-in. openings recessed 2½ in. into the face of each post at about ankle height. He mounted a light socket for a 7½-watt bulb in each recess, then ran wire to the sockets along a groove cut in the bottom edge of the lower fence rails. Foil mounted on back of each recess bounces light through translucent glass panels. Guests leaving the Kuhlman house never sing *Show Me the Way to Go Home*; the captain just "turns on" the fence.

How to light a skylight—without the sun

What looks like an ordinary skylight in this attic studio is cleverly simulated by applying regular suspended-ceiling diffuser panels to the sloping roof. Lighted from behind by 4-foot fluorescent lamps, the panels, by Moe Light, create the feeling of real skylight with sunlight streaming through. Interlocking metal molding supports the lift-out diffuser inserts.

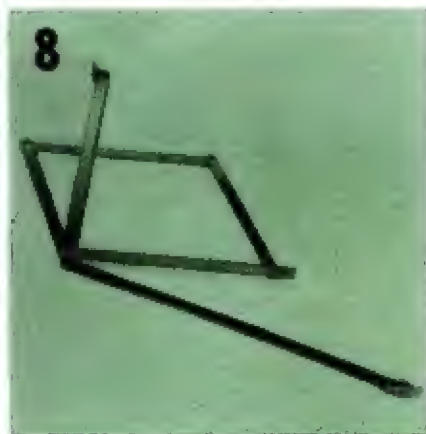
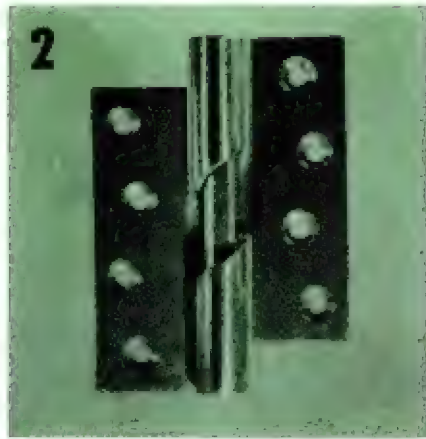




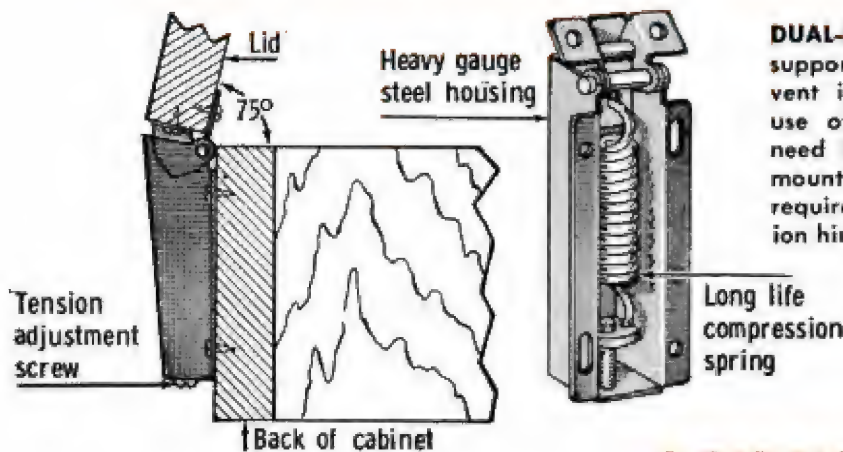
Home is what you make it!

9 Novel hinges — can you guess what they're for?

Specialty hardware exists for almost any purpose your furniture projects could require. The trick is to know about it—and where you can buy it. Pictured below are nine pivoting devices that do their jobs better than anything you could improvise. See how many of those jobs you can identify—then turn the page to check yourself.



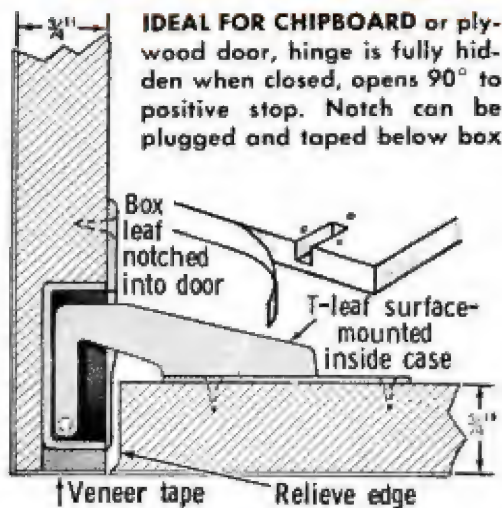
1-SELF-BALANCING LID HINGE



DUAL-PURPOSE UNIT is spring-loaded to support lid at various angles and prevent its slamming shut. It permits full use of cabinet interior and eliminates need for conventional hinging. Exterior mounting needs no mortise. If light lid requires only one support, use companion hinge, without spring, shown in photo

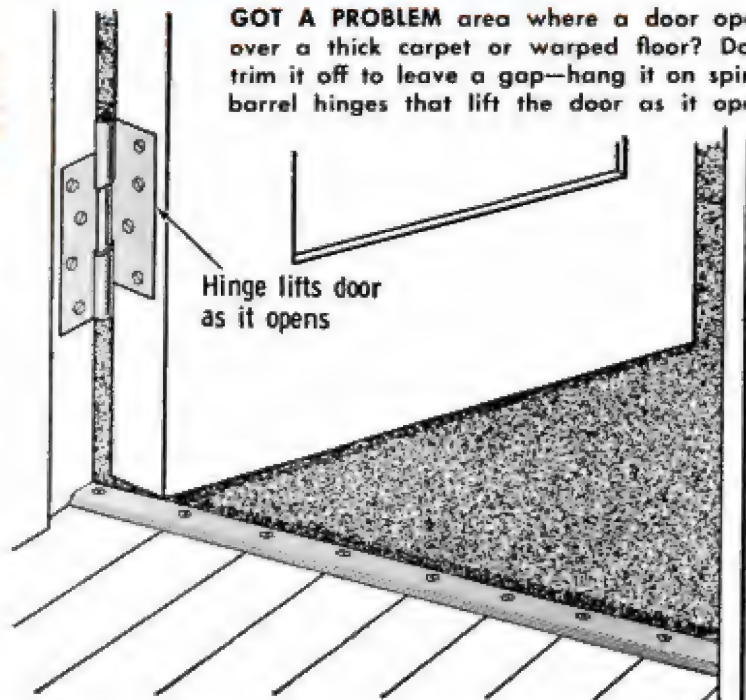
2-RISING PIN HINGE

3-CONCEALED HINGE FOR LAY-ON DOORS



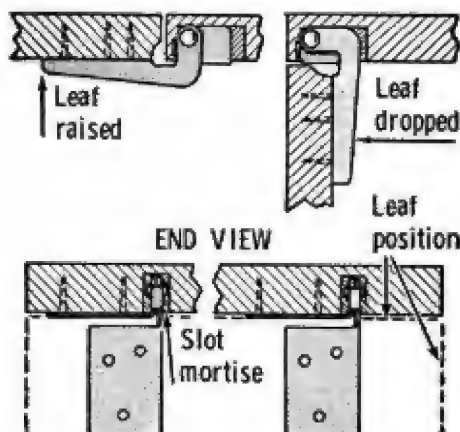
IDEAL FOR CHIPBOARD or plywood door, hinge is fully hidden when closed, opens 90° to positive stop. Notch can be plugged and taped below box

GOT A PROBLEM area where a door opens over a thick carpet or warped floor? Don't trim it off to leave a gap—hang it on spiral-barrel hinges that lift the door as it opens



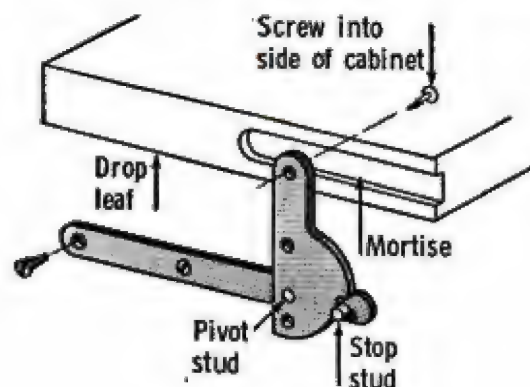
4-FLUSH-JOINT DROP-LEAF HINGE

INVISIBLE HINGE offers easy mortising and a flush joint in both positions. Dropped leaf sits under edge of table and hides its own edge. Comes only as in photo, so "pair" is formed by mounting two as shown

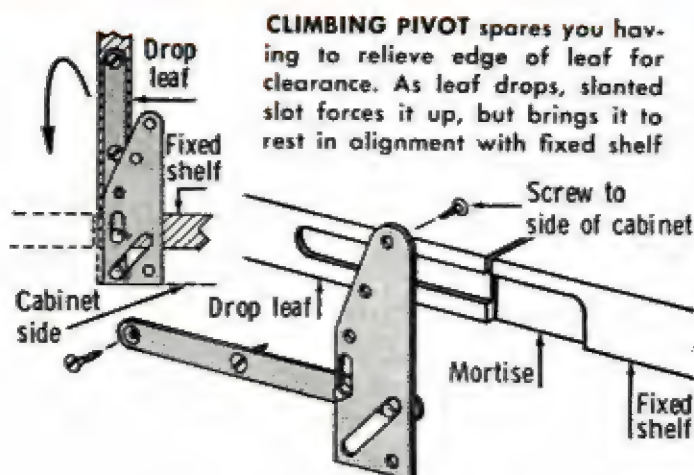


5-DROP-LEAF STOP PIVOT

COMBINATION HINGE and support provides sure 90° stop for light fall flaps, consists of two separate parts that fit together during mounting. Long leaf is recessed in edge of flap, other is screwed to inside face of side. Stud on first strikes shoulder on second

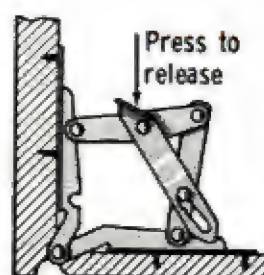


6-RISING SLOT PIVOT

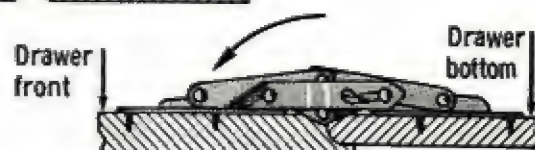


CLIMBING PIVOT spares you having to relieve edge of leaf for clearance. As leaf drops, slanted slot forces it up, but brings it to rest in alignment with fixed shelf

7-FALL-FRONT DRAWER STAY



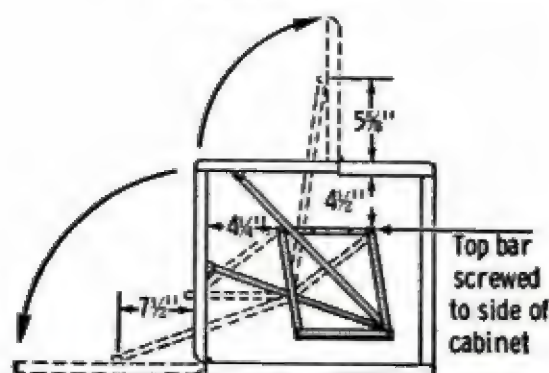
TRICK DRAWERS in some chests slide out in conventional way, then drop their fronts for shelf-type access to contents. Here's the locking hinge-stay you need. Thumb release lets front pivot down as shown



8-DOUBLE-ARM BAR STAY

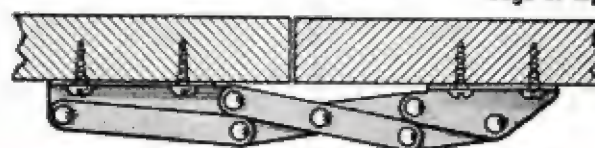
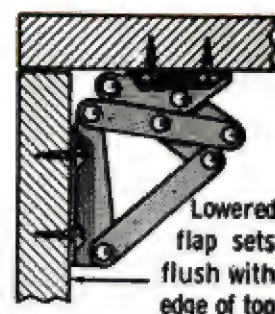


WE'RE CHEATING to classify this one a hinge, since flaps must be hinged separately. Bracket at left opens both front and top flaps of bar cabinet at once while lifting shelf forward for easy access. Only top bar of bracket is anchored to cabinet; bar that parallels it is an angle to accept shelf



9-LAZY-TONG FLAP HINGE

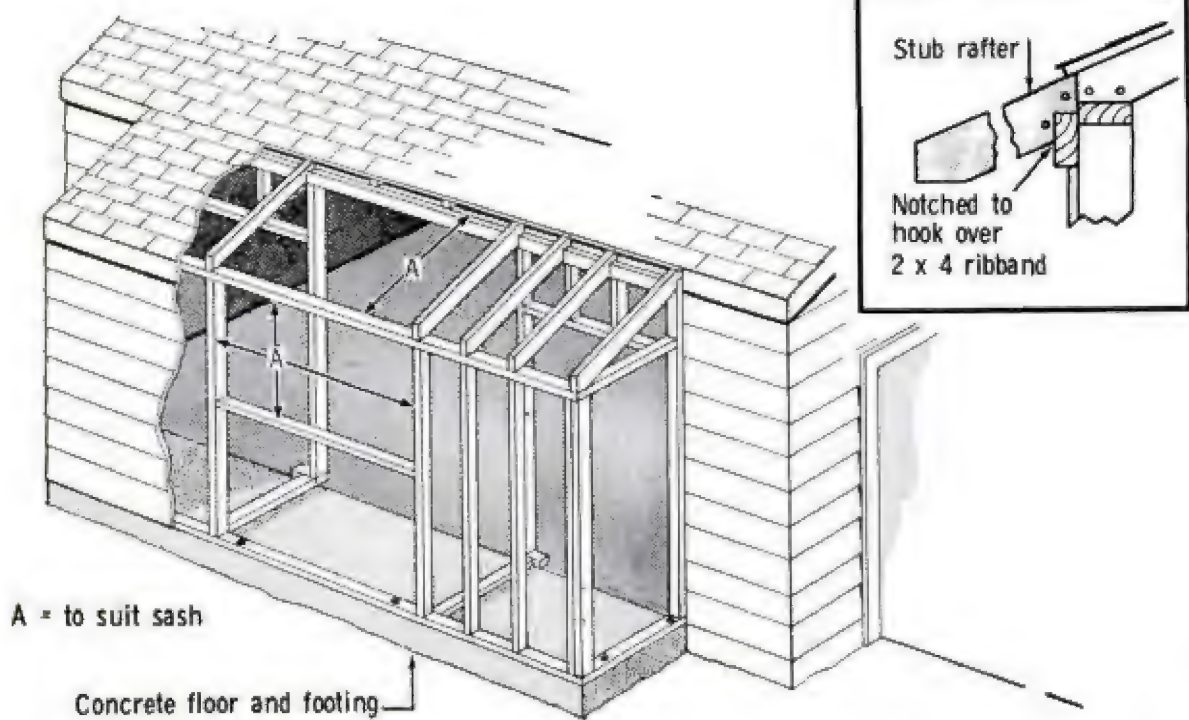
INSOLUBLE PROBLEM: hanging a flap so it tucks flush under table edge yet raises snug against that edge, using an invisible hinge that needs no mortising. It's solved with a pair of these plus a pull-out support



WHERE TO BUY THE HINGES

The nine hinges come from a variety of manufacturers—several are British imports—and are available by mail from Selby Furniture Hardware Co., 15-19 East 22nd St., New York, N. Y. 10010, at these prices (postage extra):

| | | |
|------------------------------|--------------|------------|
| 1. Self-balancing lid hinge | Cat. No. 633 | \$1.25 ea. |
| Companion hinge | 653 | .66 ea. |
| 2. Rising pin hinge (3 1/2") | 466 | 2.50 pr. |
| 3. Concealed hinge | 852 | 1.42 pr. |
| 4. Flush joint hinge | 417 | .96 pr. |
| 5. Stop pivot | 229 | 1.22 pr. |
| 6. Rising slot pivot | 231 | 1.90 pr. |
| 7. Fall-front drawer stay | 445 | 2.70 pr. |
| 8. Bar shelf stay | 215D | 6.50 pr. |
| 9. Lazy-tong flap hinge | 427 | 2.48 pr. |





Home is what you make it!

Add-on bay takes load off garage

Garage bursting at the seams? Here's a way you can add storage and satisfy a frustrated hobby to boot

IF YOU'VE HAD a hankering for a window greenhouse with a potting bench but no place for it, you'll have all the more reason to do something about that crowded garage. For by adding a bay along one side to relieve the overflow and clutter, you'll have a fine opportunity to include a dandy little greenhouse right smack in the middle of it. Its windows can be a couple of storm sash, sealed with caulking to make them watertight, and the potting bench can be either a mere shelf or a full-fledged cabinet with lots of drawers to store all the paraphernalia needed to satisfy a green thumb.

The added storage the bay affords will provide welcome out-of-the-way parking for the bulky yard and garden equipment that hardly leaves room for the family car.

The thought of tackling such a project shouldn't scare you. If you're handy with saw and hammer, it's really not as big a job as you might think. Before you touch the garage at all, your first step is to pour a footing and floor for the bay, making it even with the garage floor itself.

The width of this narrow slab will be determined more or less by the width of the window which will be used for the greenhouse roof. Perhaps you know where you can get a couple of those large, older wooden storm windows. They are ideal since you can bevel the edge of one to meet the other tightly at the front.

Naturally, you can't remove the whole side of the garage at once. In fact, after you have taken off the sid-

ing, and the sheathing, if any, you should first add to the wall the studs which will form the end posts of the greenhouse opening. Once these are in place, you can start removing the studs and sill that fall between them. Don't touch any more studs in the garage wall for now, but concentrate on erecting the outer framing of the bay.

Here you should first add the 2x4 plate around the three sides of the slab and anchor it with bolts embedded in the slab at the time it is poured. You'll need an identical top plate of 2x4s which, in turn, is spiked to the upper ends of the studs that form the outer walls. The studs, of course, will be shorter than the garage studs due to the slant of the roof; you can determine their length by placing a long straightedge on the garage roof and letting it extend out over the bay. By deducting the thickness of the roof boards and the top plate, plus the width of the stub rafters (from the measurement to the bottom plate), you'll arrive at the proper length.

As in normal house construction, the studs should be spaced 16 in. on centers, the corner posts being doubled. The lower ends of the studs are toenailed to the bottom plate.

Part of the fascia board at the eave of the garage will have to be removed to expose the ends of the roof rafters. Then, as shown in the inset detail, a 2x4 ribband is nailed directly to the outside of the garage studs, $\frac{3}{4}$ in. or so below the top of the top

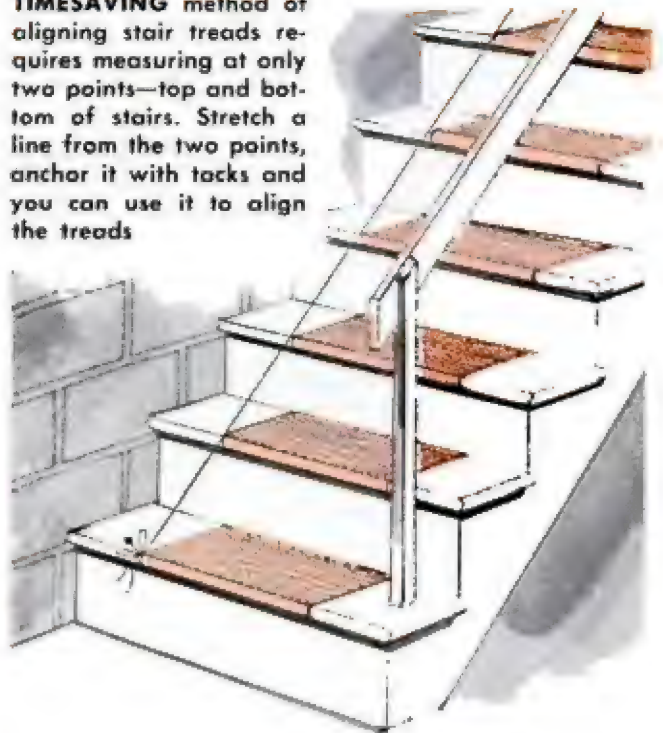
(Please turn to page 175)

SOLVING HOME PROBLEMS

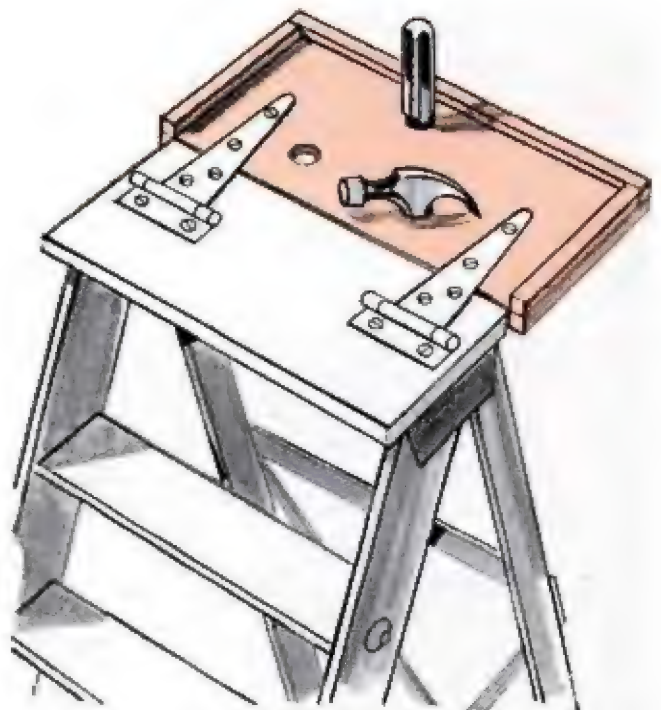


BEFORE YOU POUR a patio in which redwood dividers are set, drive large nails into the sides of the redwood below surface level at about 10-in. intervals. These will anchor the divider strips and prevent their springing up

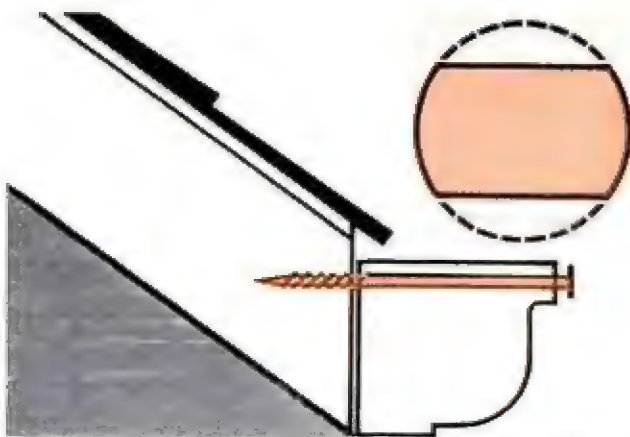
TIMESAVING method of aligning stair treads requires measuring at only two points—top and bottom of stairs. Stretch a line from the two points, anchor it with tacks and you can use it to align the treads



SOCK THOSE MOTHS with a simple vaporizer made by filling the foot of an old nylon stocking with moth balls and knotting the upper end. The nylon allows the air to circulate for more efficient vaporization



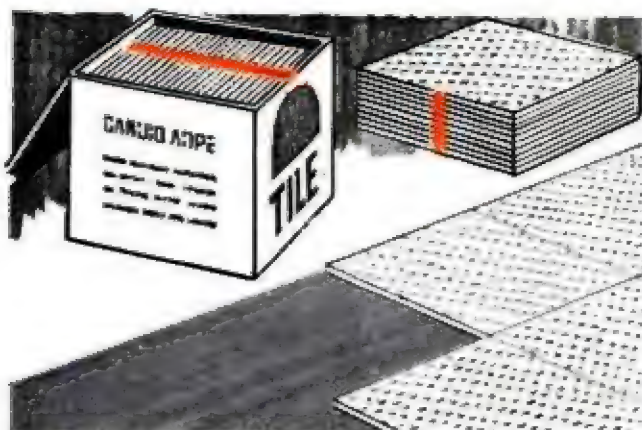
FLIP-TOP SHELF for stepladder features holes to hold hammer, screwdrivers and other tools, enlarges top step to provide room for a can of paint. Make it as shown, using bolts to attach hinge to the ladder



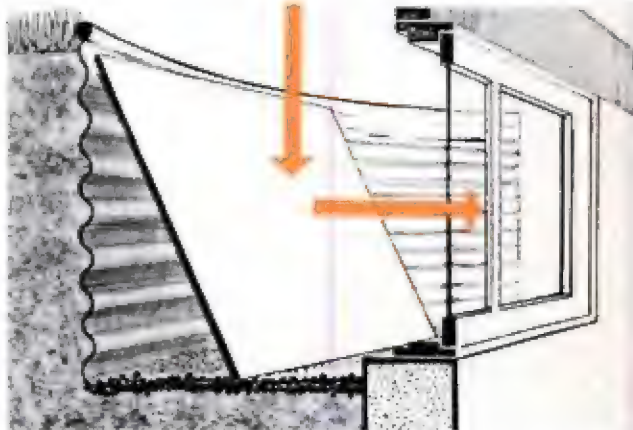
PLAN AHEAD when installing box-type aluminum gutters and you'll avoid trouble later if they have to be removed. File two flats on each spike head so you'll be able to twist the spiral shank out with a wrench



THROW-AWAY LINER for rim of paint can prevents it from becoming clogged with paint. Just press a pipe cleaner into the bead to soak up the paint. When the job's completed, lift it out and replace the lid



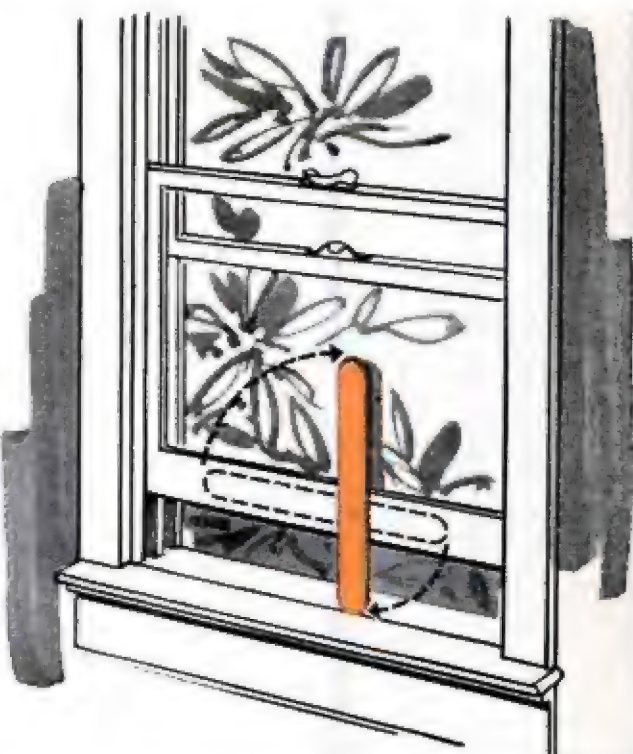
KEY LINE on embossed floor tile simplifies installation. Tile must be laid in one direction to avoid shadow effect, so open each box from same end and scribe line across tile edges with chalk or crayon



TO BOUNCE LIGHT into a dark basement cut a piece of exterior plywood to set at an angle in the window well and give it a couple of coats of high-gloss white exterior enamel. This makes a fine reflector

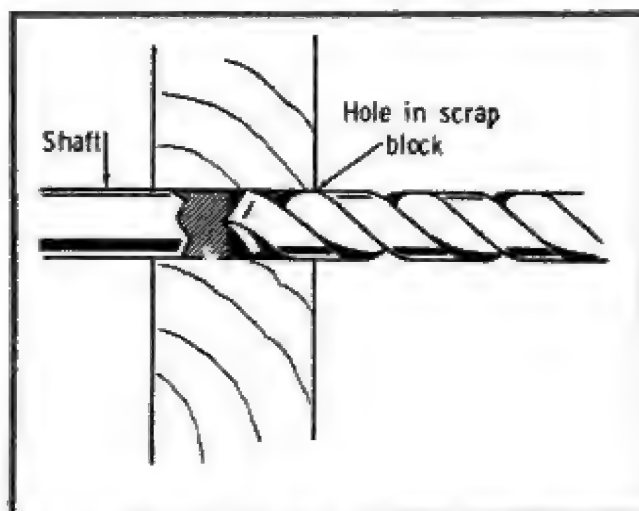


CHAIR EASEL for budding young artist costs almost nothing to make. Just nail a retainer strip across the seat of an old wood chair to support a plywood "easel" against the back and add a shelf underneath

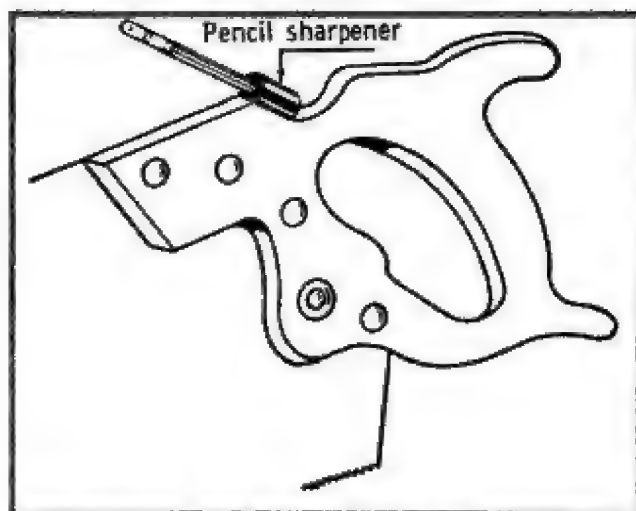


PIVOTED PROP for garage window holds sash opened at two different heights. Make the prop narrow enough so that it won't keep the window from closing fully, and install it with a pivot screw near one end

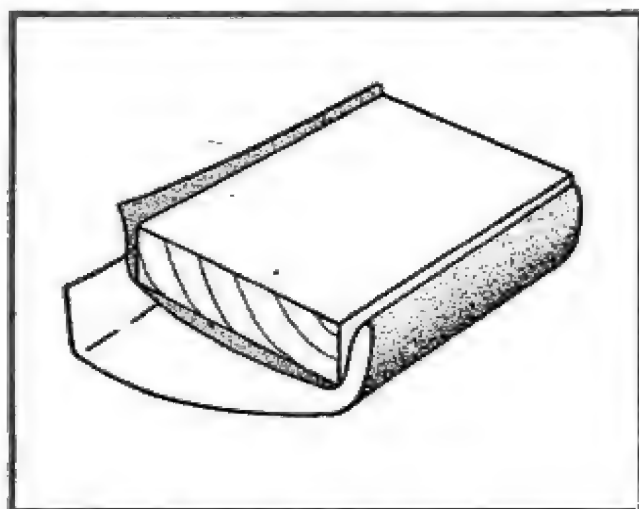
6 Helpful hints to make shop work easier



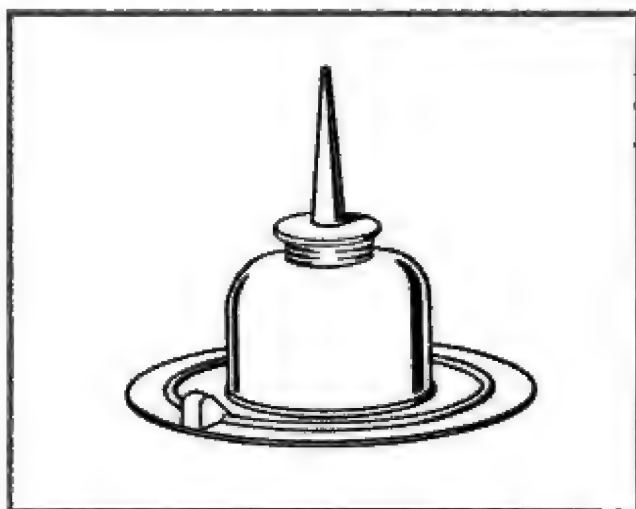
TO CENTER-DRILL ROUND STOCK without a lathe, drill a same-size hole as the stock in scrap of hardwood. Insert stock as shown, then insert the drill from the other side. The resulting hole will be centered



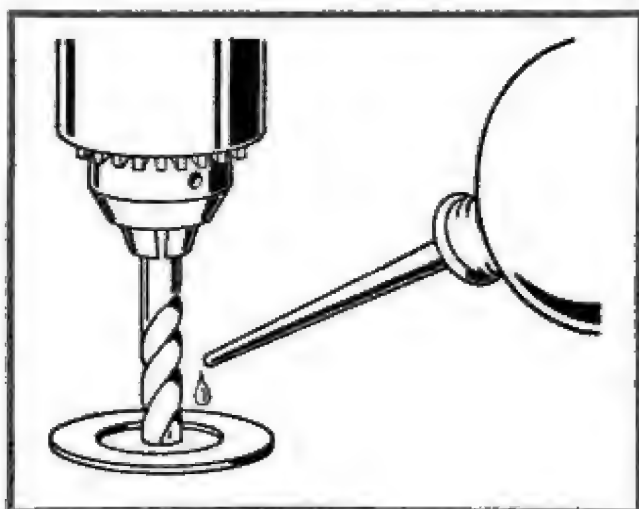
YOU START TO MARK A BOARD for sawing—and your pencil breaks! A simple gimmick to minimize and overcome this aggravation is the gluing of a dime-store pencil sharpener on top of saw handle



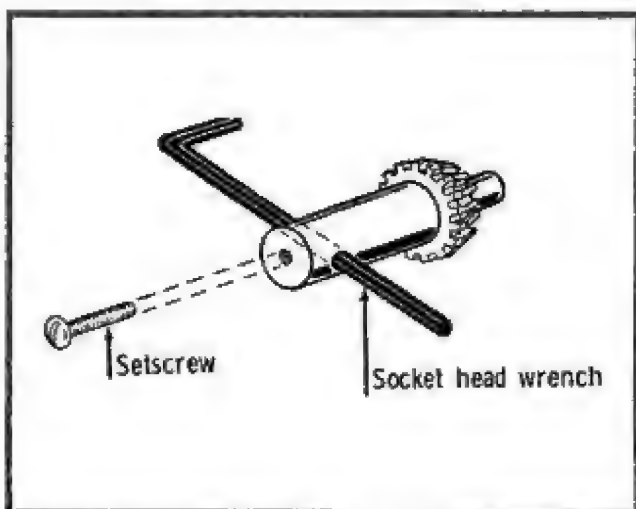
RELIEVE FINGER CRAMP acquired from trying to hold sandpaper to a sanding block. Fold the paper in half, abrasive side out, before wrapping it over the block. The paper will cling to block with a nonslip grip



A BEAUTIFULLY KEPT WORKBENCH is the pride of many a home craftsman. Here's a trick to help keep your bench free of stains: use one of those large, flat sink stoppers as a coaster for your oilcan



CONSTANT LUBRICATION is often required when drilling holes in metal. When drilling flat stock on a drill press, put a rubber washer around the hole to serve as an oil reservoir; then feed lubricant to it



IF YOUR CHUCK-KEY HANDLE BREAKS, replace it with an Allen wrench of size you often use. If hole is too small, enlarge it to permit wrench to be press-fitted; if too large, use a setscrew through top

NEW FOR CAMERA BUFFS

BY LEONARD SAMUELS



1

1. "Split-personality" Dual-Filmatic has detachable Super 8 magazine for \$209.50 and takes magazine for Single 8. Tri-Filmatic version can also handle regular 8. They reverse, have power zoom and through-the-lens operation. Honeywell, Inc., 4800 E. Dry Creek Rd., Denver, Colo.



2

2. Instamatics get an assist from the \$4.50 Duo-Pak: +1 close-up lens and color filter. Tiffen Optical, 71 Jane St., Roslyn, N.Y.



3

3. For the meticulous guy, there's the Model-D Speed Roll Applicator for cleaning and conditioning film. For \$37.50, you get applicator, antistatic cleaner, cleaning rolls. Electro-Chemical Prods., 89 Walnut St., Montclair, N.J.

4. Develop anywhere with Brooks Daylight Deep Tank at \$7.50. Film is unwound when tank is closed. One-step developer works in four minutes. Burleigh Brooks, 420 Grand Ave., Englewood, N. J.

5. Like flashcube idea? The Rotocube Flashholder permits most cameras to use them on accessory shoe or cable. Cubes rotate automatically by spring. Priced under \$22. Eastman Kodak Co., 343 State St., Rochester, N. Y.



5



4

YOUR OUTBOARD MOTOR



What's the truth about fuel mixes?

Every outboard manufacturer has his own ideas about how much oil you should mix with the gas. Here's the story behind this hassle and what it means to you

By Henry B. Notrom

IN THE OLD DAYS, anyone who owned an outboard could tell you the right fuel mix for any make of motor—one quart of oil to every six-gallon tank of gas. The motors grew larger, the engineering more sophisticated, but the 24-to-1 ratio remained as sacred as the Ten Commandments. Until 1962.

That year, McCulloch suddenly revised its fuel-ratio recommendations upward. In quick succession, the other companies also introduced new oil-gas recommendations,

which resulted in no end of confusion. Even today, few people (including dealers) can give you the manufacturer's fuel-mix recommendations for every brand of motor.

What do the new ratios mean to you? Money in the pocket, for one thing. You spend less on oil, because you use less oil. Greater efficiency, for another. Many engine problems of the past are almost completely eliminated with today's new oils. In other words, it's real engineering progress.

Manufacturers were experimenting with

reduced oil-gas ratios as far back as 1939. Ironically, the engines were ready for reduced ratios long before an oil was available which would provide safe lubrication in a leaner mixture.

The oil breakthroughs began in 1962, but it wasn't until last year that the last major outboard manufacturer announced a reduced fuel mixture for his products.

To get the most benefit from the new ratios, you have to know not only *what* your motor's manufacturer recommends, but also the wherefores behind his recommendations. And even more important, the right way to carry them out. We went straight to the companies for this information, and here it is:

McCulloch. In 1962, McCulloch Corp. announced development of an oil that could be mixed with gasoline in the ratio of 100 to 1 (6 ounces of oil to 5 gallons of gasoline). This fuel mixture is still recommended today for all McCulloch and Scott two-cycle engines from 1962 to the present, except the 3½-hp model. But to use this ratio, you *must* use McCulloch's 100:1 Outboard Motor Oil.

The original 100:1 Outboard Motor Oil marketed by McCulloch is no longer with us. In 1964, the company reintroduced the product in an "improved" form.

What makes this oil—or for that matter, any outboard engine oil—better for use in two-cycle engines than automotive oil? Frankly, no manufacturer who markets an outboard oil is willing to reveal any secrets.

Generally, though, outboard oils are classified as ashless oils, either SAE 30 or SAE 40 in weight, that contain polymeric thickeners, detergents and dispersants, among other things. Now let's decipher all this Greek.

By "ashless" is meant that the oil, when burned, leaves little if any foreign matter (particularly carbon) inside the engine. Automotive oils, which contain mineral detergents that cause little harm inside a four-cycle engine will, when used in a two-cycle, leave deposits as the oil is burned. The fact that outboard oils do not leave these deposits results from the use of *organic* detergents in outboard oil, which dissipate as oil is consumed.

Polymeric thickeners are used in the oil to prevent piston scuffing which could oc-

HOW ABOUT PREMIXES?

Premixed fuels, which contain outboard engine oil, are mixed in one of three ways:

1. At a bulk plant of the manufacturer.
2. At the marina by a representative of the manufacturer.
3. Oil and gas are provided the marina in separate containers and a mixing pump is used to mix the fuel to the ratio specified by the customer.

It is perfectly okay to use a premix in your outboard engine, provided it is at the correct ratio specified by the engine's manufacturer. Keep in mind, though, that as of the moment, if a marina is supplied with a premix made at a bulk plant or otherwise mixed by the refiner, it is probably at a ratio of 24 to 1. This is fine for use in Mercury engines.

However, in OMC's, McCulloch's and Chrysler's of the correct year, you can still take advantage of the 50-to-1 mixture. Simply have the marina dilute the 24-to-1 premix with enough gasoline to arrive at a 50-to-1 mixture.

cur at the reduced oil level. In addition, two-cycle oil does not contain a dilution inhibitor as does automotive oil. This inhibitor prevents gasoline from diluting oil in a car's crankcase. In a two-cycle engine, though, you *want* the oil to be diluted by the gas to enhance mixing of the two in the gas tank.

Getting back to McCulloch, if 100:1 Outboard Oil is not available, any other *outboard engine oil* can be employed at a ratio of 50 to 1 (that is, about 1 pint of oil to every 6 gallons of gasoline). Preferably, that oil should be McCulloch's 40/50 Two-Cycle Motor Oil, which was introduced in 1964. The "40" part of the label refers to two-cycle engines other than outboards, such as chain saws, power mowers and go-karts. The ratio for these is 40 to 1.

McCulloch does not recommend the use of an automotive oil in its engines except in emergencies—like when you're stranded on Big Creek with only a gas station around.

OMC (Johnson and Evinrude). In September of 1963, in conjunction with introduction of its 1964 Johnson and Evinrude models, the Outboard Marine Corp. an-



AFTER 155 HOURS running wide open on manufacturer's recommended mix (McCulloch 100:1 in this case), top piston looks fine. Bottom piston shows the effect of using premium automotive fuel in an outboard

nounced that a fuel mixture of 50 to 1 (1 pint of oil to every 6 gallons of gasoline) can be used. This applies to 1964 to present models. The 50-to-1 fuel mixture should not be used in a new engine, though, until that engine is operated for the first 10 hours at a 24-to-1 mixture.

OMC does not market its own brand of outboard oil. Instead, the company states that "a reputable outboard motor oil or a regular *SAE 30 grade automotive engine oil*" can be used. Be careful in interpreting that italicized portion.

Assuredly, you can use any outboard motor oil, including Kiekhaefer's Formula 50 and McCulloch's 40/50, in OMC engines at a ratio of 50 to 1. But you can't use *any* automotive oil.

Automotive oil is classified as MS or MM. One or the other is imprinted on every can of oil. Do not use MS oil under any circum-

stances. It contains a high concentration of mineral detergents. When this oil is burned in a two-cycle outboard engine, a tremendous accumulation of deposits, particularly carbon, will be left. These deposits will glow red-hot under operating temperatures and cause preignition, which is erratic combustion of the fuel mixture.

In fact, in tests run by outboard engine manufacturers it was found that after as little as 59 hours of operation, use of MS oil caused complete destruction of the engine. Center main bearings fail, and cylinder block assemblies, crankshafts and pistons are damaged beyond use.

However, OMC does state that automotive oils designated as MM (or ML-MM) can be used in OMC engines at the 50-to-1 ratio. These oils do not have a great concentration of mineral detergents in them and are generally classified for use in engines subjected to medium-duty operation.

You may come across a can of oil carrying the designation ML. Do not use it in OMC engines. It is designed for light-duty use, and when mixed with gasoline will not have sufficient lubricity to adequately lubricate an OMC engine.

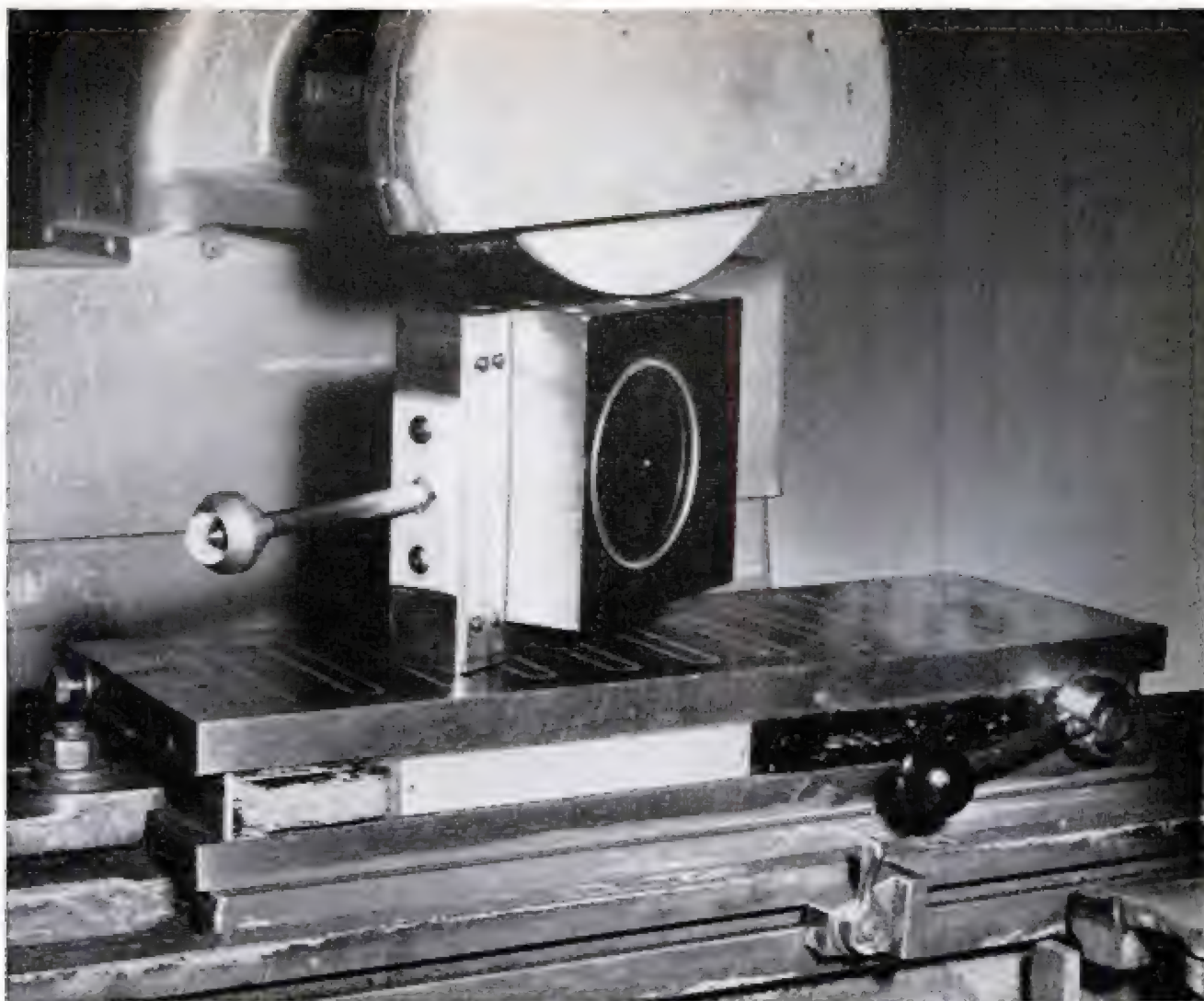
All OMC two-cycle outboards prior to 1964 should continue operation at a fuel ratio of 24 to 1.

Kiekhaefer. In September of 1965, Kiekhaefer Corp. announced development of an oil it felt suitable for use at a ratio of 50 to 1 in Mercury outboards. The oil, called Formula 50 Quicksilver Outboard Motor Oil, is classified as a low-ash multi-functional motor oil, SAE 40 in weight.

The 50-to-1 fuel mixture with Formula 50 oil can be used in all Mercury two-cycles from 1963 to present models. In the event Formula 50 isn't available, the company recommends use of Quicksilver Formula 2 oil at a 24-to-1 ratio.

These are the only two oils recommended for use in Mercury engines. "In an emergency," a company spokesman told me, "an owner can use a regular two-cycle outboard oil at 24 to 1. But it has to be a *real* emergency before he should use an automotive oil, and then only one designated MM."

Chrysler. Chrysler (nee West Bend) made its announcement of the 50-to-1 ratio in late 1964. The ratio is recommended for use in all its engines for 1965 and 1966.



VACUUM PLATE IN PLACE on magnetic table for surface-grinding edge of workpiece held by suction alone

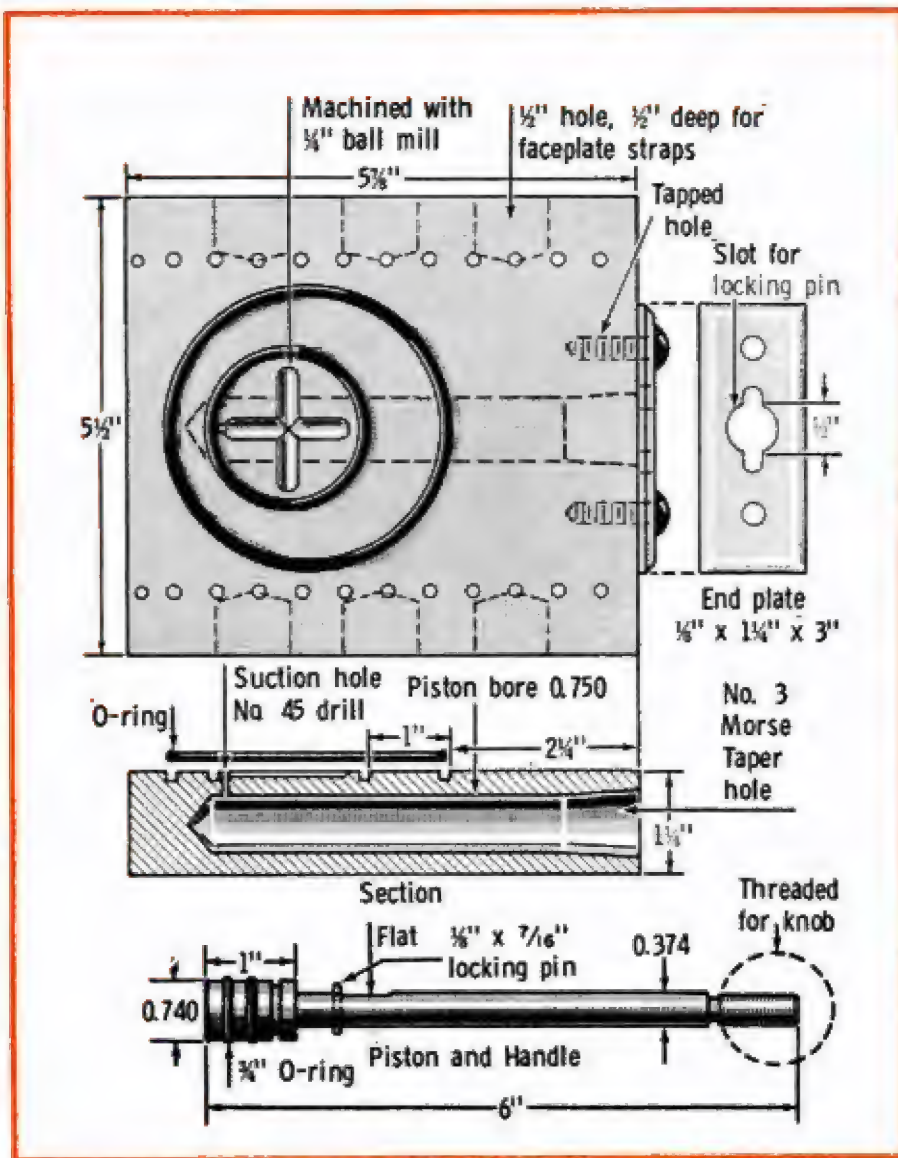
Make this unique work-holding vacuum plate

STUDENTS at the Brockton Trade High School at Brockton, Mass. are an ingenious group. When a parent suggested they make a work-holding plate for their surface grinder that would grip the work by mere suction, the class and their instructor, John T. Lane, set to work and developed this unique vacuum plate. Now, instead of having to follow the old practice of using double-faced tape to hold the work to the grinder table, they quickly anchor it by sucking it firmly to the top of a heavy workplate. Better than any tape, since there is no chance of movement, the vacuum plate also lets them use all the coolant they want—another problem with tape.

Mounting the workpiece to the plate is as simple as can be. First you place



WORK IS ATTACHED securely to vacuum plate by pulling piston which sucks air trapped between workpiece and plate through a tiny hole inside the O-rings



it on top of the rubber O-rings that are half buried in the surface. Then with the piston all the way in, you press down firmly on the work as you pull the piston all the way out. This creates a strong vacuum on the workpiece which is maintained by turning the piston's handle 45° to lock it in its extended position. It's now nigh impossible to pull the work from the plate. To break the vacuum and release the work, you simply unlock the piston and push it all the way back into the plate.

Obviously, to obtain a vacuum the surface of the work must be perfectly flat and so it is necessary to machine one surface first. Likewise, the work has to bottom perfectly on the plate if ground surfaces are to be parallel.

The plate can be made almost any size although the overall dimensions given in the drawing presented above will meet most home and school-shop requirements. Here, again, while only two O-rings were used in the surface of the

original, more can be added if desired. In determining the proper comparative sizes of O-rings for any given plate, if the larger of the two surface O-rings measures 3 in., the piston O-rings should be about 3/4 in. in diameter. For every 1-in. increase in the diameter of the surface rings, the piston rings should be increased 1/8 in.

Start out making your plate from a block of mild steel, either 1018 or 1020. If a vertical miller with a rotary table is used to machine the O-ring grooves in the plate, you won't have to bother boring the 1/2-in. holes in opposite edges as indicated. However, if the ring grooves are to be lathe turned, you'll need these holes for mounting the block to the faceplate with metal straps. The straps are

inserted in the most convenient pair of holes on each side and then bolted to the faceplate.

To turn the circular grooves, first lay out and punch the center of each. Then bring the tailstock up and use it to accurately center the large groove first as you strap the block to the faceplate. After turning the large one, shift the block and turn the groove for the small ring.

The outside diameter of the surface grooves must be 0.005 in. *larger* than the o.d. of the ring and the groove's inside diameter must be 0.005 in. *smaller* than the ring's inside diameter. The depth must be about 0.011 in. less than the actual sectional diameter of the ring. This means that there is 0.005 in. clearance on each side of the ring when it's placed in the groove. The O-ring itself must project about 0.011 in. above the surface of the plate to obtain proper vacuum and contact with the workpiece.

(Please turn to page 191)



How to cope molding

WHEN INSTALLING cove or crown molding around the ceiling of a room, you should remember that while outside corners are generally mitered, inside corners should always be coped—you should never miter both. If you do, the inside ones will later open up when the wood shrinks, making a poor joint.

Coping is the term applied to cutting the reverse shape of one molding to coincide with the profile contour of the adjoining molding when the two are butted together.

Transferring the reverse shape to the molding can pose a perplexing problem. However, there's a simple stunt to follow that will give you a near-perfect fit every time. The line of cut is actually "marked" by placing the molding in a miterbox and sawing the end at a 45° angle. Here you will notice that the molding is set in the miterbox in the same position as it will be installed—the part that fits flat against the wall is placed flat against the back of the box.

The very edge of the 45° cut estab-



lished the line of cut which is now carefully followed with a coping saw held at right angles to the face of the molding. The waste piece removed will be wedge-shaped. Where all corners of a room are inside corners, only one end of each molding is coped, the other end is simply sawed off square to butt into the corner—Western Wood Products.

NEXT MONTH IN SHOP AND CRAFTS

ALL ABOUT SEALANTS. Winter may seem a long way off now, but by the time next month's *PM* hits the stands you'll be knee-deep in fall maintenance jobs. To help you with one of the biggest of these prewinter chores, the October issue includes a detailed guide to choosing home caulking materials, complete with a three-page clip-out chart

SMALL-JOB CONCRETE MIXER. It's perfect for those small patching jobs, and you can build it for \$25. No wheelbarrow or mortar box required with this undersized mixer, either—the five-gallon bucket lifts right out of its basket for easy on-the-job pouring. Watch for detailed plans and photographs of this handy midget mixer in next month's issue

LIVING ROOM THEATER WALL. It looks like any paneled wall, but when you start to push the control buttons, things begin to happen. Tall stereo speakers rotate to face out into the room. Panels slide aside to reveal a color TV and a big 4-ft.-square screen on which you can show slides, sound movies or even TV, all by rear projection. It's all remote-controlled and concealed in a 5x14-ft. closet. You'll see complete plans in next month's *PM*



Build this CB intercom and keep track of your kids

You can convert an old telephone to a citizens band transmitter—then use it to keep track of your children while they're outdoors

By CHRIS STEVENS



DINNER'S READY! CB radio replaces the old dinner bell. Contained in phone housing, it fits anywhere



BE RIGHT THERE! We hope she will. That little radio keeps mother right at hand with active daughter

FOR A FEW DOLLARS you can replace the present case of your CB hand-talkie and convert it into a professional-looking, convenient, untippable deskset. Your children can use an unmodified transceiver. While any telephone deskset and CB transceiver will do, I used the Allied Radio Knightkit C-100 transceiver and the Olson PH-76 phone.

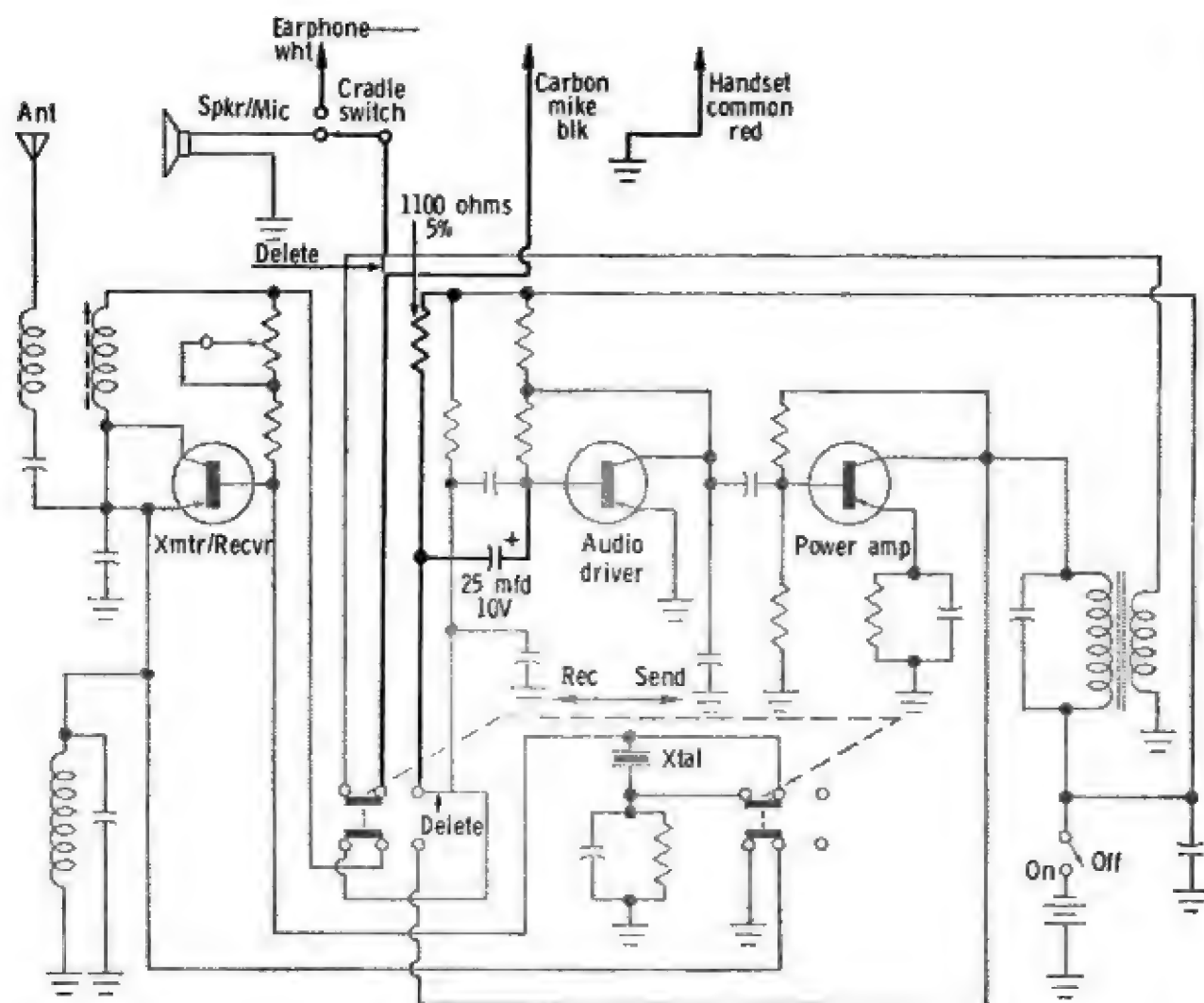
Disassemble the phone completely and clean it thoroughly. Remove all extra wiring. Only the single-pole, double-throw terminals of the switch assembly are needed. Cut off the unused portion with jigsaw, coping saw or hacksaw. Five of the screw terminals are left intact. This makes it easier to connect the speaker, earphone, carbon microphone and switch to the transceiver circuitry.

The red wire of the handset cord is

common to both the earphone and carbon microphone and goes to the common connection in the transceiver. The earphone wire (white) is connected to the normally-closed (NC) leaf of the switch. (This is the leaf that makes contact with the center leaf of the switch when the handset is lifted from its position on the cradle.) The normally-open (NO) leaf has the speaker wire connected to it.

Remove the unused screw terminals from the molded-plastic switch base and cut off one side to form L-brackets, then solder them to the printed circuit board where mounting screws usually go. Fit longer machine screws to the threaded holes. In the final assembly they go through holes in the deskset base to hold the printed-circuit chassis.

Make a 1/2-inch hole in the upper por-



CIRCUIT SHOWS WIRING MODIFICATIONS for adding carbon microphone. Added wiring is shown in deep black. Follow the diagram and text carefully to insure that finished set works the way it should



HANDSET WIRING must match this circuit. Check to make certain before you wire up your unit. At the same time, be sure there are no breaks in the wiring

tion of the base for the push-to-talk button. Mark its location carefully—it must be positioned accurately. If it is too short substitute a longer pushbutton knob or cement a piece of plastic rod or wooden dowel to the top of the original knob to have it longer—long enough to depress the switch for transmitting.

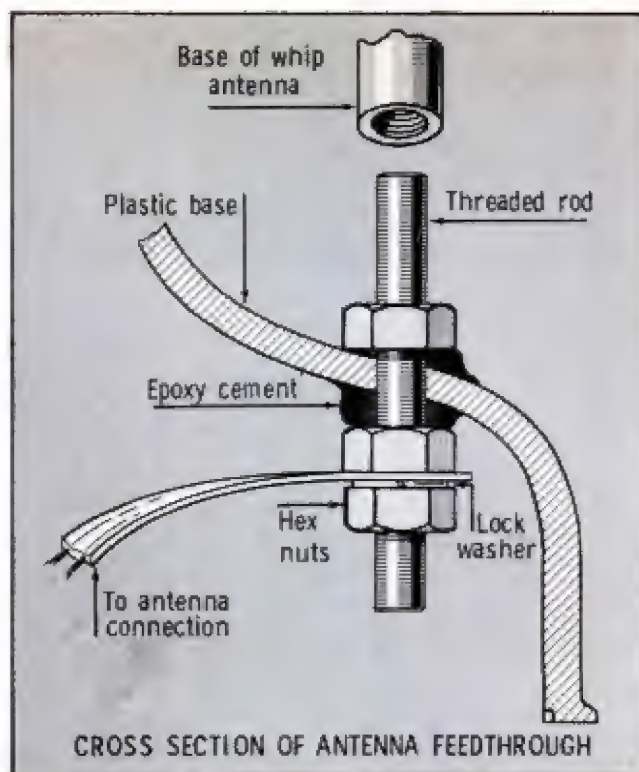
Temporarily position the printed-circuit chassis of the transceiver in the base to mark the mounting holes.

Once the transceiver chassis is mounted in the base and you are certain it will operate properly, it is safe to make the few circuit changes that are necessary.

Remove the angle bracket and mounting screw for the antenna and attach a $\frac{1}{4}$ - to $\frac{3}{8}$ -inch-wide strip of copper or soft aluminum in its place. Drill the other end to fit around a short length of 6-32 threaded rod (a 1-inch machine screw with the head cut off will do).

Insert the threaded rod in a hole drilled through the base of the deskset. If the base is metal a feed-through insulator must be used. Two hex nuts hold the rod in place.

If necessary, epoxy-cement the threaded rod in place to keep the whip antenna vertical. Keep exposed portions of the threaded rod clean. If this cement gets on the threads it may be difficult or impossible to attach the whip antenna and the



FEED-THROUGH CONNECTIONS through the plastic case are made as shown here. Epoxy cement holds threaded rod in place to keep whip antenna vertical

antenna connector strip from the transceiver chassis. Mount the battery on-off switch any place that is convenient.

Remove the bracket used to mount the switch. It makes a good template for marking the holes necessary for re-mounting the switch. File the rectangular hole to size after starting it with a couple of drilled holes.

Mount the small speaker behind the circular plate used to label the phone—the extension number. It may be necessary to cut or drill an opening for the speaker. These plates are removable. On some phones a dial is used in place of a solid disc. Protect speaker with a small louver.

With the chassis mounted at an angle it may be difficult to get to the slug used for tuning the receiver. A tuning control can be added to the front panel of the desk set. Cut the L-shaped plastic tuning tool at the bend. Mushroom the end with a warm (not hot) soldering iron.

Make a suitable flexible shaft by cementing plastic tubing and rod together end-to-end. A piece of tubing cemented inside a section of spring (like that used to hang light curtains) will work too.

The tuning control on the front of the deskset base is a countersunk flathead machine screw. A short spring, a couple of washers and a hex nut will prevent

(Please turn to page 176)

Build a 1-transistor autogen radio

By JOSEPH D. AMOROSE

HERE'S A SENSITIVE, one-transistor regenerative radio to tune local stations automatically and DX reception manually. In automatic, a switch selects up to nine preset local stations. Headphone volume is more than ample.

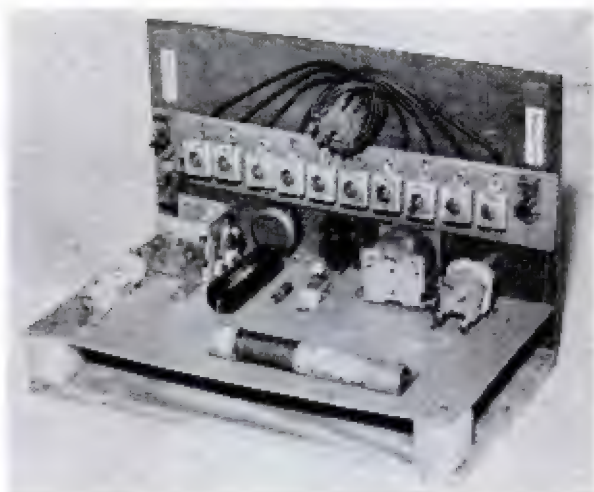
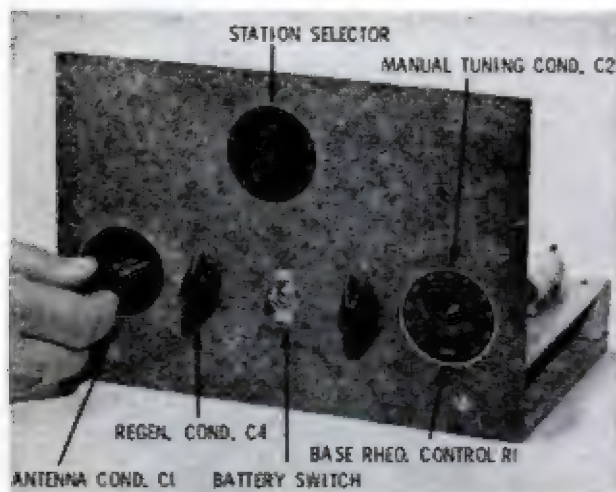
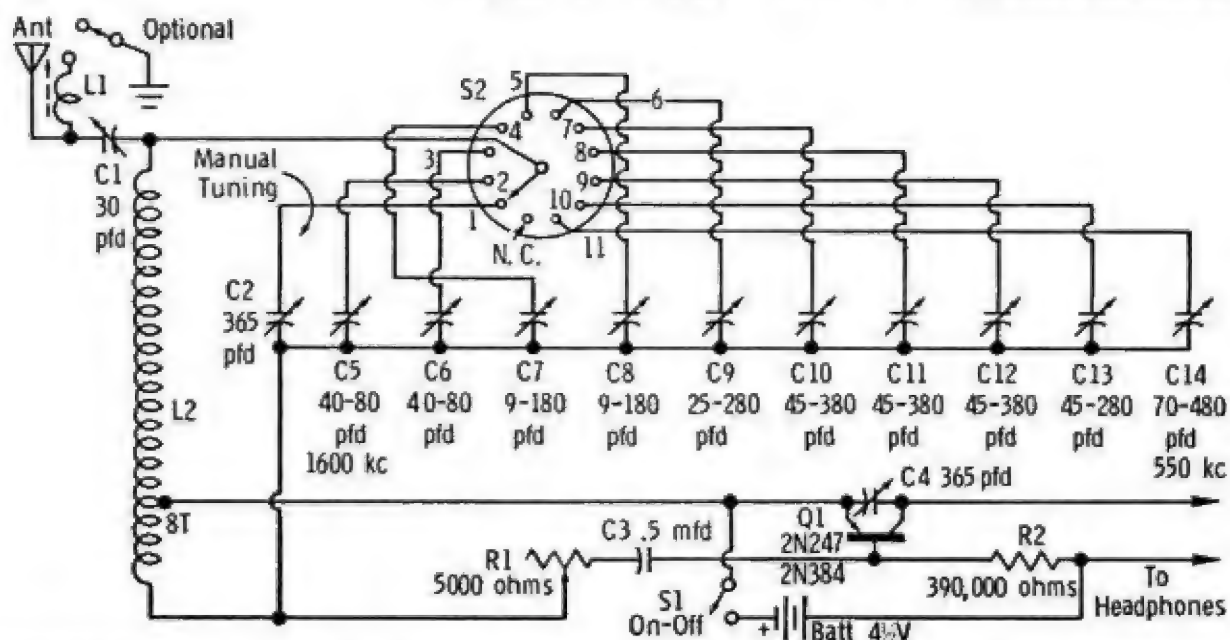
The front panel is a $9\frac{1}{2} \times 6\frac{1}{2} \times \frac{1}{8}$ -in. sheet of hardboard. The chassis is a $9\frac{1}{2} \times 5\frac{1}{2} \times \frac{1}{16}$ -in. sheet of perforated phenolic. The chassis is raised $\frac{3}{4}$ -in. from the bottom of the front panel to allow wiring room under the chassis. Angle brackets hold the pieces together.

First, mount all parts on the front panel and chassis. Mount the trimmer capacitors on a strip of wood and connect the bottom lugs of these units together. Wire the rest of the circuits according to the diagram.

You can use a standard ferrite-core antenna coil (L1), but for greater sensitivity you should make your own. On a 4-inch length of $\frac{1}{2}$ -in.-dia. ferrite coil

PRESET THE TRIMMERS, one by one, to set up the automatic tuning. Once it is adjusted, a listener can choose any one of nine preset stations by just turning a switch





material, starting 1/4-in. from one end, wind 70 turns of No. 24 DCC wire. Make a tap at 8 turns. Mount coil (L2) as shown, at the rear of the chassis, as far from other circuit components as possible.

After completing the set, hook it up to an antenna (you'll need 100 feet or more of 7/22 antenna wire). No ground is used as it broadens tuning. But when greater volume is desired, a ground will help.

To set up for automatic tuning, turn on the set and move the rotary switch to position 1. Tune C2 to a station at about 900 kc. Adjust C1 for best selectivity. Set C4 to a point where audible oscillation just stops. Now set R1 until volume is comfortable.

Next turn the rotary switch to position 2

and adjust the appropriate trimmer to bring in the desired station. Use a plastic tuning tool. Identify the station on the front panel next to the proper switch position. Repeat for each trimmer. ★ ★ ★

PARTS LIST

- C1—30-pfd. variable capacitor
C2—365-pfd. variable capacitor
C3—.5-mfd. capacitor
C4—365-pfd. variable capacitor
C5, C6—40-80 pfd. trimmers
C7, C8—9-180 pfd. trimmers
C9—25-280 pfd. trimmer
C10, C11, C12, C13—45-380 pfd. trimmers
C14—70-480 pfd. trimmer
R1—5000 ohms, rheostat
R2—390,000 ohms, ½-watt carbon resistor
Battery—4½ v. (3 D-cells in series)
Q1—2N247 or 2N384 transistor
S1—s.p.s.t. toggle switch
S2—Single-pole 12-position rotary switch
L1—Standard ferritecore antenna coil
L2—(see text)
Headphones—2000-ohm

PM's Guide to Basic Remodeling Measurements

Whether you want to remodel your kitchen or add a room to your house, this guide can be of immense help in the planning stage. It provides some basic measurements of common structures, equipment and materials and recommended minimum dimensions. Tear out this card and keep it as a handy reference. Widths are given as the narrower horizontal dimension or as the distance from left to right from the front of an item. Heights are given from the floor or from the bottom of suspended items. Depths are from front to rear. Some measurements are not given because they vary widely or are not significant for the remodeling project.



FRAMING

Width and height of rough opening are $3\frac{1}{2}$ " larger than the door. Head and side casings are $\frac{1}{2}$ " x $1\frac{1}{4}$ "; exterior door sill is $1\frac{1}{4}$ " x $7\frac{3}{4}$ "; a stock jamb with a $\frac{1}{2}$ " rabbet is $1\frac{1}{4}$ " or $1\frac{3}{4}$ " x $5\frac{1}{4}$ "

ENTRANCE DOOR

Standardly 2'6", 2'8", 2'10" and 3' wide, and 6'8" and 7' high; thickness is $1\frac{3}{4}$ "

INTERIOR DOOR

Most commonly 2'4" and 2'6" wide; 6'6", 6'8" and 7' high; thickness is $1\frac{3}{4}$ " or $1\frac{1}{4}$ "

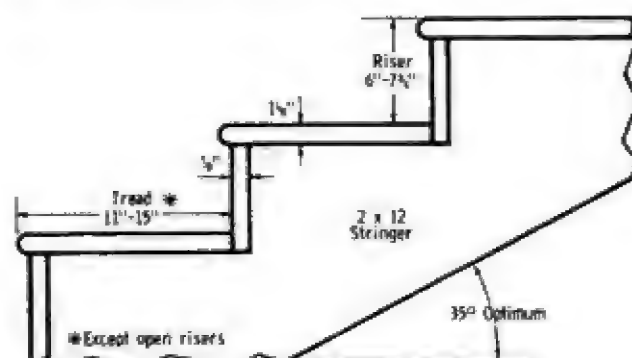
DOORBELL BUTTON

Commonly 45" above top of doorsill

DOORKNOB

Commonly 36 $\frac{1}{2}$ " from floor

STAIRS Recommended stairway width 2'10"-3'



Outside stoop should be 4'6" deep to allow for storm door swing. Minimum step tread is 12" with $\frac{1}{4}$ " pitch. Brick steps should be header fronted

WINDOWS

Placement height is based on aligning with room door top. Measure distance from ceiling to door molding. Window sizes are widely variable. Common wood double-hung sizes: 2', 2'4", 2'8" and 3' wide; 3'2", 3'10" and 4'6" high

RAILINGS

STAIRCASE—Height 2'10"-3'

PORCH AND DECK—Height 3'

HOUSE WIRING

MAJOR EQUIPMENT WATTAGE RATINGS

| | | | |
|-----------------|----------------|--------------------------|-------------|
| Air conditioner | 850-1200, 3100 | Motor, $\frac{1}{4}$ hp. | 530 |
| Attic fan | 500-1500 | Oil burner | 300-550 |
| Clothes dryer | to 4500 | Range | 7000-14,000 |
| Dishwasher | 530-1000 | Refrigerator | 200-670 |
| Disposer | 380-530 | Television | 200-400 |
| Furnace blower | 380-670 | Toaster | 600-1350 |
| Heater | 1000-1650 | Washer, automatic | 350-900 |
| Home freezer | 300-670 | Water heater | 750-3000 |

ROOMS—MINIMUM SIZE RECOMMENDATIONS

| | | | | |
|--|------|-------|--------------|----|
| KITCHEN, for 4 persons, depends on layout and equipment | 7' | 10' | | |
| BATHROOM | 5' | 7' | | |
| DINING ROOM with 36" chair room | 10' | 10' | | |
| BEDROOM, including 8' of clothing drawer space per person: | | | | |
| Single bed | 8' | 12' | or 10'x10' | |
| Double bed | 12' | 13' | or 10'x15' | |
| Twin beds | 12' | 15'6" | or 10'x17'6" | |
| GARAGE without laundry or shop: | | | | |
| One car with 8' or 9' door | 12' | 22' | | |
| Two-car with 2-8' or 16' door | 19' | 22' | | |
| Storage above car hood | | | 4' | 5' |
| Workbench on side, add to width | 3'6" | | 36" | |
| Floor should pitch toward door $\frac{1}{4}$ " per foot | | | | |

FURNISHINGS & APPLIANCE RECOMMENDATIONS

| KITCHEN | WIDTH | LENGTH | HEIGHT THICKNESS | DEPTH | CLEARANCE |
|--|---------|--------|------------------|---------|-----------|
| Base Cabinet (undersink and corners not included in frontage; height includes counter top) | 6'-10' | | 36" | 22"-25" | |
| Common individual widths: 12", 15", 18", 21", 24", 27", 30", 36", 42", 48" | | | | | |
| Wall cabinet—for 4 persons | 6'-10' | | | 12" | |
| —for service for 12 | 10'-14' | | | 13" | |
| | | | | 14" | |
| Common individual widths: 15", 18", 21", 24", 27", 30", 33", 36", and 44"-60" (triple units) | | | | | |
| Common heights: 15", 18", 21", 24", 30", 31". Top shelf maximum height from floor is 6' | | | | | |
| Cabinet placed above range | | | | | 30" |
| above sink | | | | | 22" |
| above counter | | | | | 15'-18" |
| Counter space needed (not including corners; may be reduced by multiple use) | | | | | |



PM's Guide to Basic Remodeling Measurements

| | WIDTH | LENGTH | HEIGHT THICKNESS | DEPTH | CLEARANCE |
|--|-----------------|----------|-------------------|--------------|------------------|
| next to: Refrigerator | 15"-18" | | | | |
| Sink, each side | 18" | | | | |
| Food preparation, mixing | 36" | | | | |
| Range | 15" | | | | |
| Oven | 15" | | | | |
| Wall oven—Open door should be 3"-5" below wife's elbow. Average height from floor to bottom of oven is 27"-32" | | | | | |
| Common kitchen appliance sizes: | | | | | |
| Refrigerator | 36" | | 59" | | |
| 1-bowl sink | 24" | | | | |
| 2-bowl sink | 36" | | 36" | | |
| Range | 30" | | | | |
| Built-in range | 30" | | | | |
| Built-in oven | 24" | | | | |
| Dishwasher | 24" | | 34½"-38" | | |
| DINING AREA | | | | | |
| Dining table, allow 2' per person | 30"-42" | | 30" | | (36" 20" knee |
| 8 persons fit at a 5' round, a 4' square or a 3'x8' rectangle | | | | | |
| Dining counter | | | 36" | | |
| Barstool (footrest 6"-8" from floor) | | | 24"-25" | | 12" knee |
| Wainscoting | | | 30" | | |
| BATHROOM | | | | | |
| Sinks | | | 31"-36" | | |
| Tubs, square & square corner | 3'10", 4'1½" | | | | |
| Tubs, rectangular | 2'6"-2'9" | 4'-5'6" | | | |
| Free-standing shower cabinet, square and corner | 2'8"-3'6" | 6'3"-7' | | | |
| Toilets | 17¾"- 29¾" | | | 26"- 31¾" | 18" front |
| Shower head | | | 74" | | |
| Curtain rod for tub | | | 78" | | |
| Towel bar | | | 36"-42" | | |
| Medicine cabinet from floor | | | 48"-54" | | |
| Tiling (4¼"x4¼")—room walls, plus trim | | | 10 tiles | | |
| —tub area from floor, plus trim | | | 16 tiles | | |
| BEDROOM | | | | | |
| Double bed (inside frame measure) | 54" | 75", 78" | | | |
| Twin bed (inside frame measure) | 39" | 75", 78" | | | |
| Clothes closet (depth is minimum) | | | 7'-7'6" | 22" | |
| Closet rod | | | 5'3" | | |
| Chest of drawers | 36" up | | 28"-34" | 18"-21" | |
| WORK AREAS | | | | | |
| Laundry area space in front of washer and dryer | 66" | | | 36" | |
| Space for hand ironing | 72" | | | 52" | |
| Bookshelves and cases (adjustable shelves have pin holes 1" o.c.) | | | 6'6" to top shelf | 8"-9" | |

MATERIALS

BOARD & LUMBER SIZES

Nominal & actual dimensions: 1x2=¾"x1½", 1x3=¾"x2½", 1x4=¾"x3½", 1x5=¾"x4½", 1x6=¾"x5½", 1x8=¾"x7½", 1x10=¾"x9½", 1x12=¾"x11½"; 2x4=1½"x3½", 2x6=1½"x5½", 2x8=1½"x7½", 2x10=1½"x9½", 2x12=1½"x11½"

SHEET MATERIALS

Interior plywood—Most common sizes: 4'x8', 4'x10' and 4'x12'; also available, widths 30"-48", lengths 5'-12', thicknesses ¾" and ½"-¾" by eighths

Exterior plywood—Same dimensions as interior except in thicknesses: ¾" and ½"-1¼" by eighths

Gypsum wallboard—Width 4', lengths 4' and 8', thicknesses ½"-¾" by eighths

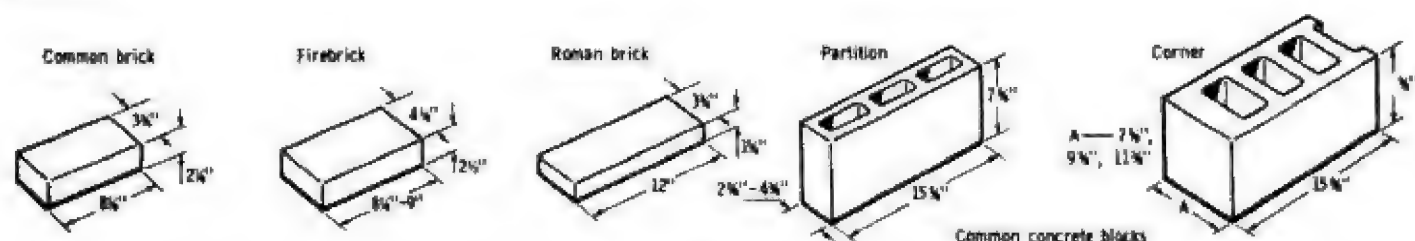
Asbestos cement wallboard—Width 4', lengths 4' and 8', thicknesses ½" and ¾"

Fiber wallboard—Standard width 4', lengths 4'-12', thicknesses ¾"-¾" by eighths. Also 4'x14' & 16', 8'x14' & 16' and 8'x18'

Hardboard, standard & tempered—Widths 2', 4' and 5'; lengths 2'-16'; thicknesses ¼"-¾" by sixteenths

Plastic laminate—Widths 24", 30", 36", 48"; lengths 60", 72", 84", 96", 120", not all combinations; thickness ¼"

MASONRY



Concrete—General-purpose mix is 1:2¼:3. To make 1 cu. yd., use 6¼ sacks of cement, 14 cu. ft. of sand, 20 cu. ft. of gravel and 6 gal. of water per bag of cement

INSULATION—Commonly available are rolls and loose insulation. Rolls are 16" o.c. x 36'; loose comes in 4-cu.-ft. bags; also 16" and 24" o.c. 4' batts and 8' blankets (o.c.—on center)

New slant on fun



New International® Scout® Sportop®

Take off in a SCOUT with a new slant-back top (hard or soft) and you'll have more fun going for you than anything else on wheels.

We call this one the new SCOUT SPORTOP. The people who use it are

goers, anglers, surf-boarders, hunters, escape artists, campers, ski buffs, swingers, fun types—almost everyone.

With its tough engine and all-wheel drive, the SCOUT climbs steep hills, rolls over rutty roads, churns through sand and mud—goes almost anywhere, roads or no roads.

And with bucket seats plus a lot of other fancy fixin's inside, it's a pretty classy way to travel city streets or

get to the suburban shopping center.

Why not go down to your nearby INTERNATIONAL Dealer to look it over. Take your wife along. Give the new SCOUT SPORTOP a real test drive—just to get a new slant on fun.



**INTERNATIONAL HARVESTER
COMPANY**
CHICAGO, ILLINOIS

SCOUT is the registered trademark for a vehicle manufactured exclusively by International Harvester Company



The little more you spend buys shock protection.

And that's priceless.

Did you ever get a "buzz" from electricity? Did it worry you? Maybe you *should* be worried. Here's why:

Experts say that the difference between a "buzz", a "jolt" and a fatal accident depends on a few technicalities. Are your hands wet? Are you touching a ground? Things like that.

If you want your health, perhaps your life, to depend on technicalities, that's your business.

If you want safety, you want Millers Falls Shock-Proof tools. So safe they need no grounding. So safe they carry the U.L. seal of approval. And remember — U.L. puts ungrounded, double insulated tools through many more torture tests than ordinary tools. Remember, too, safety is only the first of the benefits we offer.

While we were retooling for Shock-Proof

production, we built in every worthwhile new feature known to tools. You'll notice the superior performance as soon as you squeeze the trigger switch.

The performance keeps right on performing, too, hour after hour, and day after day. For proof, read the Millers Falls Lifetime Guarantee — a 100% repair or replacement guarantee extended to the original user. Millers Falls will repair or replace any tool which fails for any reason other than abuse or normal wear, provided the tool is returned to Millers Falls transportation prepaid.

How do we dare lay our money on the line with the industry's strongest guarantee? Easy. We know what's inside Millers Falls tools. Also that *to make tools safe, you've got to make them better. We do, in Greenfield, Massachusetts.*

Part of world-wide **Ingersoll-Rand**

Millers Falls

The safest name in tools.

Paint on a "new roof" in beautiful color

New aluminum roof coating • stops leaks

- restores old asphalt shingles
- adds harmonizing color



Before you spend money on a new roof, ask your paint dealer about a remarkable, brand-new aluminum roof coating being introduced this month. There's a choice of fade-proof colors. One coat weatherproofs and beautifies. And at a fraction of the cost of a new roof.

Users report they apply it for less than \$10 per 100 sq ft. It can add 5-10 years to the effective life of your present roofing.

Developed by Alcoa Research Laboratories, this new coating has been tested for more than five years under many weather conditions by Alcoa and several large paint companies.

They found it particularly effective on asphalt shingles, where it stops leaks by sealing small nail holes and cracks, bonds roofing granules, gives uniform appearance to old, patched surfaces.

New colored aluminum roof coatings, made with Alcoa® Pigments, will soon be marketed by many leading paint manufac-

turers. If your dealer doesn't stock these coatings, he can get them for you.

Aluminum Company of America
853-1 Alcoa Building
Pittsburgh, Pa. 15219



Please send your folder on colored aluminum roof coating. My name and address is:

My dealer's name and address is:

Change for the better with Alcoa Pigments



ADD-ON BAY

(Continued from page 151)

plate. Stub rafters are then notched and cut to hook over the 2x4 ribband and to rest on the top plate of the outer wall, to which they are toenailed. Like the studs, the stub rafters are spaced 16 in. on centers or simply located in line with the garage rafters.

Add the skylight before covering the roof with plywood. The two rafters which support it should be spaced so the sash laps just midway on them. This will then provide a nailing surface for the plywood. Embed both the plywood sheathing and the window sash in mastic before nailing them to the two rafters. Metal flashing is used to seal the window at the garage roofline. This is tucked up under the first row of shingles and bent at right angles to lap the sash. Mastic is used to seal it. The asphalt shingles applied to the roof to match those on the garage should lap the skylight an inch or so at the sides and then sealed with mastic. The front window of the greenhouse is set in mastic also and is nailed to the edges of the studs. Like the top sash, this one also should lap midway on the studs to provide a nailing surface for the wall siding.

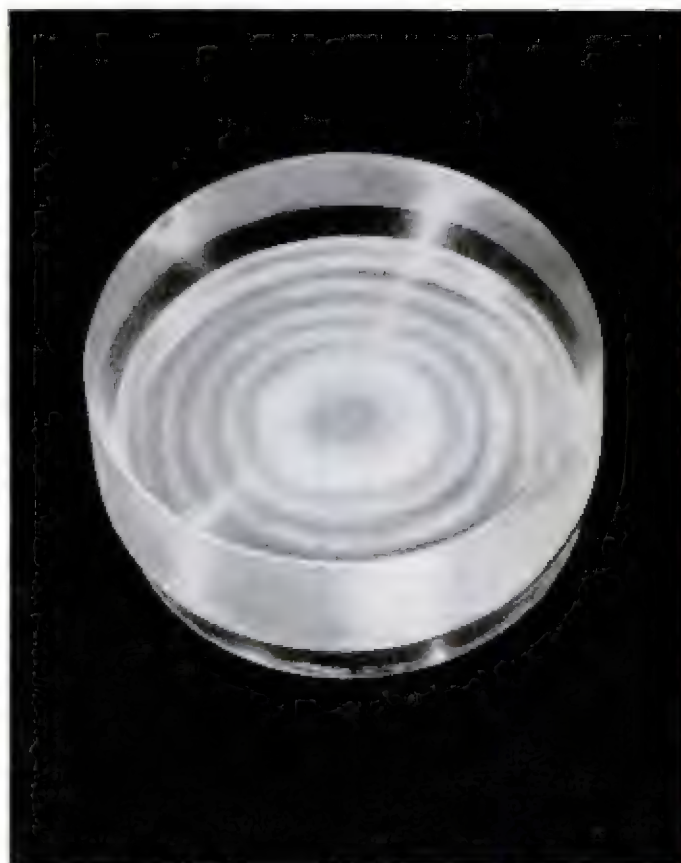
All that remains is cutting the doorways to the storage areas and paneling the sidewalls of the greenhouse nook. You'll notice that header members support short studs above them, and that a portion of the sill is cut away in each case so it will not interfere with wheeling heavy yard equipment in and out. Either sliding or hinged doors can be fitted to the storage closets. How you want to make the potting cabinet to satisfy your individual requirements is up to you. ★★

Deep sea valley

An 800-mile crack in the ocean floor has been discovered between the Hawaiian Islands and the Aleutians.

The near 15-mile wide trench resulted some 50 million years ago from a massive undersea upheaval which raised a mountain range over a half mile high and dropped part of the adjacent bed one-half mile, forming a valley or trough extending in a northeast-southwest direction.

Not yet named, the newly-discovered break is the northernmost of a series of fracture zones which include the Mendocino, Murray and Molokai Fracture Zones. The discovery is the result of the SEAMAP project, an intensive program aimed at mapping the ocean bottoms.



**Accurate to
.000011 of an inch**

**... but it's not
good enough for you!**

This is a picture of a quartz test glass in contact with a lens being checked for accuracy of curve. The concentric circles are "Newton's Rings" which permit measurements in fractions of a wavelength of light. This lens is a reject. It misses our specification by 11 millionths of an inch. More than a century of optical research and manufacturing excellence have made us sticklers for uniquely high standards. That's why shooters who want to be sure — as well as proud — of their equipment own B & L telescopic



sights. Everything you want to know about rifle scopes is in our 85-page manual, "Facts About Telescopic Sights." Send 25¢ to Bausch & Lomb, Rochester, New York 14602.



BAUSCH & LOMB

WE CAN'T THE ROUTE



SHORTEN

But we can give you the tough-job tire for stop-and-go pickup & delivery work: The Workhorse. Up to 25% more rubber between the cord and the road.

Every time you hit the brake or the accelerator, your tires feel it, too. That's why you need the tough-job tire—even when you're hauling a light load.

Up to 25% more mileage.

The Workhorse is built for the stop-and-go grind of pickup and delivery. It has Tufsyn, toughest rubber Goodyear ever used in tires. And more of it—where it counts. 20% deeper tread. Thicker undertread, too. Up to 25% more rubber between the cord and the road. For as much as 25% more mileage than tires now used in most pickup and delivery work.

Light trucks don't always travel light.

This is no Sunday tire. Pile on the tools, appliances, sand

and gravel, camping equipment, logs or livestock. The Workhorse has stronger sidewalls for extra load-carrying strength. Helps you haul more. In fewer trips.

Cuts rocks and potholes down to size.

The Workhorse is a natural on rough roads. Or no roads. Take off across a cornfield, or jump a curb. The strong triple-tempered nylon cord carcass shrugs off bruises, bumps and scrapes.

Get a longer ride for your tire dollar.

Workhorse prices start at less than \$15.00.* Get Workhorse tires for pickups, panels or light delivery trucks. At your Goodyear Dealer's or Goodyear Service Store. Goodyear, Akron, Ohio 44316.



The Workhorse tire gives you a choice of two tread designs. Rib type (shown above) for over-the-road use. Extra-traction design for on and off the road.

*(Size 6.00 x 16. Rib type. Plus \$2.40 federal excise tax. At all Goodyear Stores. See your Goodyear Dealer for his competitive prices.)

GOOD YEAR

Tufsyn, Workhorse—T.M.'s The Goodyear Tire & Rubber Company, Akron, Ohio.

Electronic & Chemical Technicians
Tool & Model Makers



If you're hunting for a go-places technical career, set your sights on this.

It's IBM's new Boulder, Colorado, facility. What'll the qualified technician find? Deer, elk and antelope hunting. Small-game hunting of every imaginable description. Top-notch waterfowl hunting. Freshwater fishing, equal to any in the world: from record brown trout to walleyes. Some of the best skiing anywhere.

You want more?

Then consider a go-places career with the leader in the field of information handling and control, IBM.

As technologies continue to advance, so does IBM's technical sophistication, and so can you—as far as your talents and ambition let you.

So, consider nature's inducements an added extra. We'll be glad to fill you in on your career opportunities as a technician with IBM. If you have a technical degree, or equivalent military and/or industrial training, write, outlining your qualifications and interests to: R. S. Labuda, Dept. 642W, IBM Corporation, P. O. Box 1900, Boulder, Colorado.

IBM is an Equal Opportunity Employer.

IBM.

CB INTERCOM

(Continued from page 168)

looseness. Adjust tension by compressing the spring with the hex nut.

Basically, circuit changes are just to substitute the carbon microphone in the handset for the dynamic speaker for listening—it doesn't replace it entirely.

Remove the wire from point 2 (output transformer secondary) to point 1 (push-to-talk switch). These points are called out on the C-100 printed circuit.

Thread one end of a 6 to 7-inch length of stranded hookup wire through the unused mounting hole at the rear of the push-to-talk switch (near C4) and solder to point 2. Connect the other end to the center leaf of the cradle switch. A lug can be attached if screw terminals are available in the deskset base. No connection is made to point 1.

Connect a 5-inch length of hookup wire between point C (where it is soldered) and the screw terminal for the handset's black wire. Put a lug on this end. Remove original wire to point C.

Prepare a 6-inch length of wire with a lug on one end. Solder the other end to point B ("common" or "ground" on the schematic). The lug end of the wire goes to the white wire of the handset.

Twist 8-inch and 11-inch lengths of wire together on one end. Solder these to the speaker terminals after removing the original wires. Solder lugs to the other two ends. The short one goes to a common, ground-screw terminal; the longer to the NO switch terminal screw.


Connect the push-to-talk switch terminal to one lead of C7 (about 1/4-inch away) which is unsoldered from the printed-circuit wiring.

Cut the negative end of a 25-mfd., 10-v. electrolytic capacitor to 5/8 inch. Solder it to one lead of an 1100-ohm resistor cut to the same length. Solder the positive lead of the capacitor to the junction of C8 and R5. Connect the free end of the 1100-ohm resistor to the negative battery terminal. The conversion of the circuit is now complete.

A simple bracket can be mounted under a speaker mounting screw to hold the battery in place. A larger 9-v. battery can be used to increase battery life.

The sound output level of the C-100 can be increased, along with the modulation, by changing the audio transistors. Replace TR-2 and TR-3 with higher gain transistors. Use a 2N107 for TR-2 and a 2N241A for TR-3.

After the transceiver is mounted in the deskset base you may have to retune it. Follow Allied's instructions. ★ ★ ★



Lucite® turns you loose



Du Pont LUCITE® House Paint will last and last. You'll paint less often, have extra free time to enjoy life.

LUCITE doesn't give paint failure a chance to get started.

For instance: When temperature changes make house surfaces expand and contract, most paints stay rigid. So they crack and flake.

But Du Pont LUCITE flexes right along with your house.

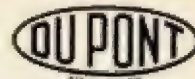
LUCITE House Paint foils blistering, peeling, fading, chalking and mildewing just as handily. It's been proven to resist them

all far longer than leading oil-base paints.

LUCITE speeds you through painting. Starting and stopping points blend naturally. And you can paint over damp surfaces—even right after it rains.

It all adds up to extra free time for you. So paint your house less often. Live a little instead.

Let LUCITE turn you loose.



**Better Things for Better Living
... through Chemistry**

See "Wonderful World of Wheels," CBS-TV, September 8 at 7:30 P.M., E.D.T.

FREE



WINDOW PLANNING IDEAS

to help you make your home more beautiful, more valuable. Send today for new, full-color folder packed with illustrated ideas and a complete description of the Andersen Window line.

(Clip and mail today!)

- ☐ I plan to build. PM-96
☐ I plan to remodel a _____

Mr. _____
 Mrs. _____

Address _____

City _____ State _____

Andersen Windowwalls 
Andersen Corporation Bayport, Minnesota

SAVE
 UP TO **85%**

GOV'T SURPLUS and NEW EQUIP'T

Send 25¢ For 3 Big Catalogs

PUMPS
 WELDERS
 WINCHES
 SURVEYING
 TELEPHONES
 HYDRAULICS
 GENERATORS

ELECTRONIC
 BINOCULARS
 GEAR MOTORS
 COMPRESSORS
 SPEED REDUCERS
 WEED SPRAYING
 MANY OTHERS



SURPLUS CENTER Dept. PM-096

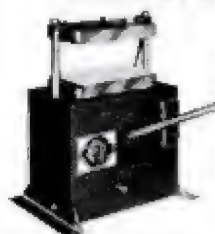
Lincoln, Nebraska

Liquid
WRENCH

LOOSENS RUSTED NUTS, BOLTS, PARTS IN SECONDS
 at Service Stations, Auto and Hardware Stores
 RADIATOR SPECIALTY COMPANY, CHARLOTTE, N. C.



START YOUR OWN BUSINESS IN A RAPIDLY EXPANDING MARKET



Now's the time to be independent... be your own boss... make more money on either a full or part-time basis. Very small working area required (in your home, if desired) to make rubber stamps, which are universally used and in growing demand. With the SIMPLE-X Press B.A. wrote, "This was certainly the best investment I ever made." The SIMPLE-X Press is tops on the market due to continued research and improvements. Orders for presses and supplies shipped same day received. You'll bless the day you wrote for full information and FREE catalog with new low prices on supplies. Do so today!

CUSTOM MFRS. 402 E. Elm, Springfield, Mo.

New "solid state" tachometer!


It's Stewart-Warner's brand new "960" model.

Fully transistorized circuitry gives the "960" a big, full-sweep dial face, plus all-in-one construction for greater dependability and easier installation. There's no separate battery, relay, or sender.

Stop at your local speed shop, service garage, or automotive parts shop. Ask to see the Stewart-Warner "960" and our other models of electric and mechanical tachometers.

Whichever tach you take, it will have the name you can trust: Stewart-Warner.

S-W

STEWART-WARNER 

INSTRUMENT DIVISION

1840 Diversey Parkway, Chicago, Illinois 60614



CLEAN CARB BETTER MILEAGE **GO GUM**

Removes gum, sludge, varnish. Cleans entire fuel line while you drive. By makers of HEET, best-known winter fuel line protection. Big 16 oz. can.

Ask for **GO GUM**

© 1966 DeMert & Dougherty, Inc., Chicago, Illinois 60650

Painful hemorrhoids?

All too often, humans who sit and stand pay the price of vertical posture. Sitting and standing combine with the force of gravity to produce extra pressure on veins and tissues in and around the rectal area. The result may be painful, itching or burning hemorrhoids.

The first thought of hemorrhoid sufferers is to relieve their pain and discomfort. However, of the products most often used for hemorrhoids, some contain no pain-killing agent at all...others have one too weak to provide necessary relief...and still others provide only lubrication.

Now at last there is a formulation which concentrates on pain. It actually has over 8 times more pain-killing power than the topical anesthetic most commonly used in hemorrhoid remedies. 8 times the power to ease the itching, pain, and burning of hemorrhoids.

The name of this product is Nupercainal. Nupercainal starts to work on contact. Provides prolonged relief from pain. Soothes and lubricates.

When you suspect you have hemorrhoids, check with your doctor. If hemorrhoids are the cause of your discomfort, chances are he'll recommend Nupercainal.

Nupercainal is available without prescription at professional pharmacies everywhere. Ask for ointment or new suppositories with free pocket-pack. (Say New-per-cane-all.)

Nupercainal®

over 8 times more pain-killing power

FREE!

Learn how you can buy used engines \$15 up, new engines \$30 with FREE confidential list and coupons when you order your plans

• **BUILD THIS MINI-BIKE!**
Plans reveal step by step details!

• **BUILD A RACING KART!**
Complete frame for less than \$10!



RUSH \$2 for plans (indicate type) or send 25¢ for brochure describing plans: PLANS, Box 517, Omaha, Nebr. 68101

GOVT. SURPLUS AND OTHER BARGAINS SAVE UP TO 90%

HEAVY DUTY AC GEAR MOTOR

Rated 1/2 HP @ 1725 RPM's. Runs on 115 V. AC, 60 cycle, single phase. Continuous duty. Reversible. 3/4" keyed output shaft 120 RPM. All metal gear case construction. Exc. for conveyor belts, garage door openers, any heavy duty-low speed use, 113 1/4" L x 7 3/4" W x 8" H. Shpg. wt. 24 lbs. NEW. Special purchase. Specify model VW120. A \$52 value. Now \$24.50.

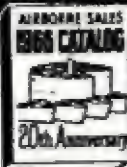


1500-1 GEAR HEAD MOTOR Speed 6 RPM @ 24 V.D.C. Reversible. 5 AMPS. Also runs well on 12 V.D.C. on reduced power. Excellent for small drive unit for winches, kids cars, powered displays, capstan, etc. Has 2 1/2" drive shaft. Shpg. Wt. 7 lbs. Like new. Tested prior to shipment. 9" L x 5" H x 3 1/2" W. Approx. GOVT COST \$97.50. Just \$12.95

DC JET GENERATOR ARC WELDING KIT complete with GE Type CM Gen. 30 V. D.C., 400 AMP, 3000 RPM; ampere rating is for continuous duty. Intermittent amperage is 500 to 600 amps. Also 2 rheostats, 1 voltage reg., 1 voltmeter, 1 electrode holder, 1 welder's mask, 1 toggle switch, 10 lb. vacuum packed 1/2 in. welding rods, pair welder's gloves & spline coupling. All units guaranteed pre-tested. Wt. 110 lbs. Approx. GOVT COST \$700. All items \$64.50



HEAVY DUTY MAGNET Fantastic power. Will pull 125 lbs. on steel block. Excellent as underwater retriever. Picks up all ferrous metals. 4 1/2" L x 1 1/2" W x 4" H. Shpg. Wt. 3 lbs. \$7.95



NEW! BIG 1966 CATALOG

Send 25¢ for amazing catalog with 1000's of bargains in hydraulics; electrical, marine, automotive items, etc. Order from ad. Prices FOB. 50% deposit for COD. Pls. include your zip code number. Satisfying mail order customers thru-out the world since 1945.

AIRBORNE SALES CO. Dept. PM966

8501 Stellar Dr. • Box 2727 • Culver City, Calif. 90230

BILL PROBLEMS?

WE CAN HELP YOU

NOBODY REFUSED UP TO \$15,000

Bad Credit No Problem • Not a Loan Co.

★ Send your name and address for FREE application ★

★ NATIONAL ACCEPTANCE, dept. M-8 ★

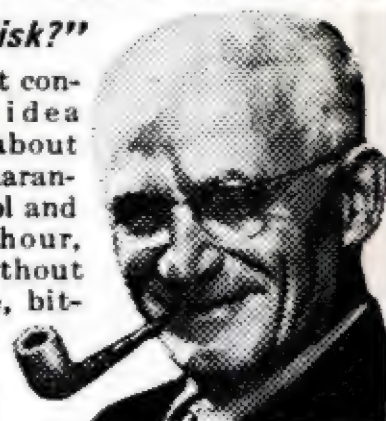
5133 N. Central Ave., Phoenix, Arizona

"WILL YOU SMOKE MY NEW KIND OF PIPE..."

30 Days at My Risk?"

New principle that contradicts every idea you've ever had about pipe smoking. I guarantee it to smoke cool and mild hour after hour, day after day, without rest, without bite, bitterness or sludge.

To prove it, I'll let you try a new Carey Pipe. Send your name and address today for my FREE complete trial offer. Write to: E. A. CAREY, 1920 Sunnyside Ave., Dept. 252K, Chicago 40.



THAT PESKY PCV

(Continued from page 111)



DON'T FORGET TO CLEAN oil-filler cap. Wash the filter in solvent, then lubricate it with new motor oil careful not to enlarge the hole.

Hose-clogging is seldom a problem in systems where the hose goes directly to the manifold, because the nipple in the manifold is large in diameter and doesn't plug up readily. If it should get clogged, a shot of compressed air will clear it.

The oil-filler cap should also be removed and cleaned when the PCV system is serviced. Wash the cap in solvent, using a brush to work the solvent into the filter material. Let it air dry, then lubricate it with the same grade of motor

oil you use in the car's crankcase.

Okay, now you know the *how* of servicing a PCV system; what about the *when*? An SOS from your system may take any of the following forms:

- A drop in gasoline mileage.
- Engine starts missing at high speed.
- Rough engine idle.
- Engine can't develop full power.
- Oil is thrown around oil filler cap.
- Oil dipstick develops a film of rust or varnish on it, indicating a buildup of contaminants in the engine.

Manufacturer recommendations as to how frequently PCV should be cleaned vary from car to car. Also, some call for cleaning the valve, others for replacing it. Check your owner's manual.

Generally speaking, when a car is driven mostly on good roads and in warm weather, the PCV should be serviced every 6,000 miles. However, a car that gets heavy use in stop-and-go city traffic—especially during cold weather—should be checked out every 3,000 miles.

Remember, the job of PCV is to help clean up America's air—not ruin your engine. You can keep it performing reliably by following the servicing recommendations we've outlined above. ★★



Get twice the fun!

RIDE

TRIUMPH

**NOW! Mail this coupon today for
FREE CATALOG in color**

Any Triumph owner will tell you—the real secret is the Fun. Getting where you want to go and when you please, is one thing. The other is the excitement you get on a surging Triumph. And when a Triumph man talks about motorcycling fun—watch out, there's no holding him back. Why not include yourself in the fun of owning a Triumph? See your Triumph dealer soon.

West
JOHNSON MOTORS, INC.
P. O. BOX 457
Pasadena, Calif. 91102

East
**THE TRIUMPH
CORPORATION**
Baltimore, Md. 21204

Name _____ Age _____

PLEASE PRINT

Street _____

City _____ State _____ Zip _____

Telephone Number _____ Dept. P

Cut or Tear

Finest clear finishes for wood



Fabulon

Tough "bowling" finish for home floors; apply with brush or roller; dries fast; lasts for years.



Fabuloy

Mirror-gloss clear finish for all wood interiors; outstanding durability; excellent resistance to soap, stains, etc.



Wood Lore

Satin-lustre clear finish for panelling, etc.; unique formulation provides luxurious "hand-rubbed" effect without rubbing.

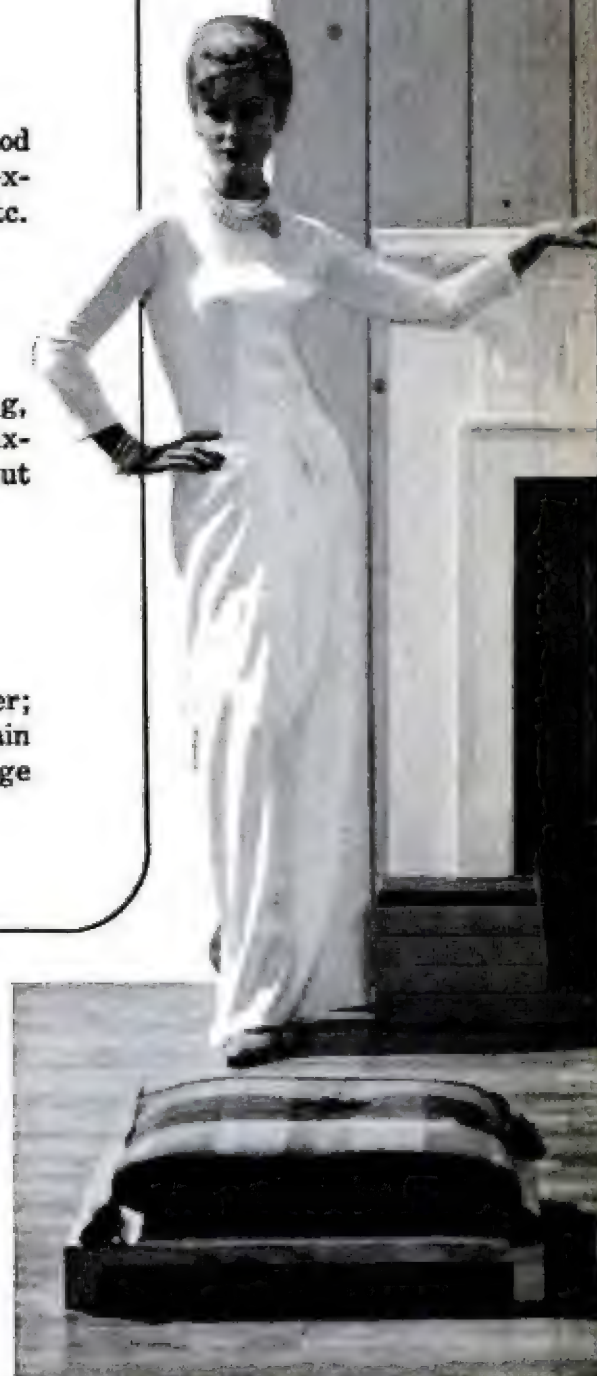


Pryme

First-coater and Wood Lightener; seals thirsty wood; helps control stain penetration; adds body and mileage to top coats.

At paint, hardware, lumber and building supply stores. Send 15c in coin for 24-page manual, "A SHORT COURSE IN NATURAL WOOD FINISHING".

PS PIERCE & STEVENS CHEMICAL CORP.
Dept. PM Box 1092, Buffalo, N. Y. 14240



How to **STOP** SMOKING

says

Dick Weber

Bowler
of the year



It isn't easy to bowl 300. Most people feel it isn't easy to stop smoking, either. But read the words of a man who has done both:

Because I wasn't feeling well, I was advised to give up my chain smoking habits. It got down to this—either give up cigarettes or give up tournament bowling. Since I was earning my living as a professional bowler, I decided to quit smoking.

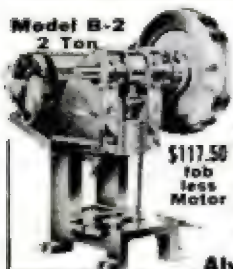
I had read about Bantron so I got some . . . and with its help I stopped smoking and haven't smoked for over a year.

It was easy and pleasant to take, didn't affect my taste, and isn't habit forming.

Bantron was discovered by doctors in the research department of a great American university. Tests on hundreds of people showed that it helped more than 4 out of 5 of all people who wanted to stop smoking to do so in five to seven days. It acts as a substitute for the nicotine in your system and curbs your desire for tobacco.

Try Bantron. It is so safe when taken as directed, that you can get it at all drug stores without a prescription. Also available in Canada.

Bantron
BRAND
Smoking Deterrent Tablets



ALVA ALLEN Swaine
Power Punch Presses
1 to 150 Ton Capacity

Complete line of Punch Presses in hundreds of different style and model combinations. Write for FREE literature on presses and complete line of punch Press accessories as—Feeds, Punch Units, Dies, etc.

Alva Allen Industries, Dept. PM, Clinton, Mo.

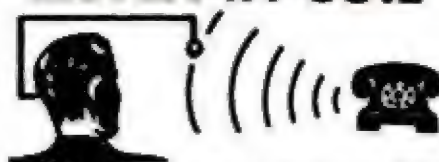


—150,000 CANDLE POWER bright beam headlights—

Fits all 4 light systems—bright sockets. American made for American cars. 75,000 candle power each united beam—over 2 1/2 times as bright as stock. A fine pencil of light that stays on your side of the road. A safety feature for highway driving. \$9.95 per pair. U.S.A. No C.O.D. please. Caution—may not be approved in some states yet.

WARREN ENTERPRISES—Box 563B—Skokie, Ill. 60076—

AMAZING NEW
"LISTEN-IN-COIL"



PICKS UP ANY TELEPHONE CONVERSATION!

NO CONNECTION TO TELEPHONE NECESSARY! You hear the entire two way conversation from a distance . . . undetected! Limited supply remaining at only \$1.98. SUPER-SENSITIVE model \$2.98. Satisfaction Guaranteed! Catalog of LISTENING DEVICES 35c. FREE with order! Save COD fee and send Check, Cash or M.O. to: Consolidated Acoustics, DEPT. 96, 1302 Washington, Hoboken, New Jersey.

Shrinks Hemorrhoids New Way Without Surgery Stops Itch—Relieves Pain

For the first time science has found a new healing substance with the astonishing ability to shrink hemorrhoids and to relieve pain—without surgery.

In case after case, while gently relieving pain, actual reduction (shrinkage) took place.

Most amazing of all—results were so thorough that sufferers made astonishing statements like "Piles have ceased to be a problem!"

The secret is a new healing substance (Bio-Dyne®)—discovery of a world-famous research institute.

This substance is now available in suppository or ointment form under the name Preparation H®. Ask for it at all drug counters.

BASEMENT TOILET FLUSHES UP



TO OVERHEAD SEWER OR SEPTIC TANK.
NO DIGGING UP FLOORS. INSTALLS EASY. Write
McPHERSON, INC. BOX 15133 TAMPA, FLA.

\$130 PROFIT

A RACE DAY WITH \$50
25 YRS. RESULTS—7 IN 10 WINS
Sensational book reveals secrets of 10 world's greatest professional race investors. 25 yrs. actual results included, showing 7 in 10 plays won and \$130 average race day profit with \$50. Genuine copyright book supplied only by publishers. Wins at all tracks, horses, harness, dogs. Cut out this ad and send with name and address for fascinating free brochure: Incl. X. Code. HITCHINGS, Box 5715-PMX-A, Carmel, Calif. 93921
Cut out and send this ad NOW for Bonanza Offer!



KING MIDGET for 1966

30% more horsepower. Amazing performance. Faster. Smoother. Quieter. Many new features. World's Lowest Priced Car. Drive it for 15¢ per week. Owner demonstrators wanted. Send 25¢ for 32 page book, fully illustrated, dealer's price. Or send \$1 (refunded first order) for this plus service and repair manual and 16 3x7 photos of car and factory.

MIDGET MOTORS CORP., ATHENS 1, OHIO



Mend it!

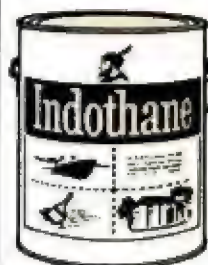
DURATITE White Glue

Just squeeze the plastic bottle for fast, easy repairs of wood, paper, plastic, leather... most anything. Dries fast, sets clear, stays watertight. For home, hobby workshop, school.

Protect it!

INDOTHANE Polyurethane Clear WOOD FINISH

Outlasts ordinary varnishes 2 to 1, brings out natural highlights in wood floors. Needs no waxing. Excellent for exterior wood surfaces.



Caulk it!

NEW DAP Latex Caulk

Won't stain, blush or bleed through latex paint — or any paint. Use it outside or inside. Forms a rubber-like seal to hide joints and cracks. Cures tack-free in 30 minutes. Sure way to make paint jobs look better, last longer.

Panel it!

DAP PANEL and DRY WALL ADHESIVE

Better than nails! Easier, too. Faster way to put wood panels and wallboard on studding and furring strips, or directly to wall surfaces. Waterproof, heatproof. Eliminates hammering, bent nails, counter-sinking, nail hole filling.



At leading hardware, paint, building supply, and specialty stores.

DAP

DAP INC., Dayton, Ohio 45431
Subsidiary of Plough, Inc.

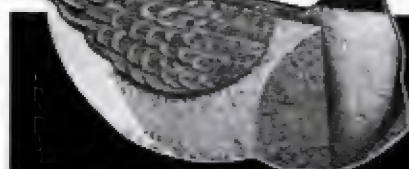
12 CANADIAN HONKER FIELD DECOYS

☐ 12 Jumbo size decoys. Life-like color and detail. Heads and bodies die cut from rigid material. Ready to use in minutes. Stakes included.

POST PAID \$9.95

DEALER INQUIRIES INVITED

SEND CASH CHECK OR MONEY ORDER NO C.O.D.'S



☐ 12 Do-it-yourself goose decoys. Specify Snags or Honkers.

\$4.95 POST PAID

MONEY BACK GUARANTEE

CANADIAN DECOYS BOX 66F, Rosemount, Minn.

You Can Develop A Profitable Business BY ENGRAVING

DOOR PLATES
DESK PLATES
BADGES, ETC.

On Plastic up to 2 inches wide.
Material and supplies available from us



#SM-100

WRITE TODAY

With this precision machine
You need no previous experience



SCOTT MACHINE DEV. CORP.

215 PROSPECT AVE., DEPT. PM-9
WALTON, NEW YORK 13856



You Can Own a 56' x 12' Mobile Home, King Size Lot and Utilities All For Only \$66⁶⁷ Per Month! Situated On Four Lane U.S. #441-27 In The Heart Of The Citrus And Lake Section of Florida!



AD646070(F-2)
For low monthly payments with nominal down payment you can immediately move into a brand new, beautifully furnished two-bedroom Mobile Home on a 75'x125' lot, with superb water and septic tank. Pay like rent and then receive title to land, improvements and Mobile Home. Offer limited, investigate before it is too late. For free booklet "Mobile Home Living in Florida", photos and information write:

ORANGE BLOSSOM HILLS INC. Dept. 607
2148 N.E. 164th Street, Miami, Florida 33162

Exciting New Products

(Continued from page 131)

Not quite . . . it just looks like it. Kaiser Aluminum offers Rustic Shingle, their eye-fooling roofing and siding material, in Sierra Brown, Shasta White and Surf Green. It can't crack or rust, and won't be ignited by flying sparks or falling embers.

Durability? Tests have shown that these shingles can withstand wind-driven rain in gusts up to 100 mph. The material can be installed over existing roofing and siding, and weighs only 50 lbs. per square (100-sq. ft.). Matching accessories include flashing, coping, ridge caps, valleys, starter strips, hip caps, gable strips and end caps. Rustic Shingle is competitively priced with other premium materials such as slate and

tile, and it carries a 20-year guarantee.

So you're not an electrical engineer. Don't worry. You needn't be to tackle one of the most dramatic of home-improvement jobs—the installation of recessed lights. The Armstrong Cork Co. will provide you with complete easy-to-follow instructions for the task.

Overhead recessed lighting begins with a suspended ceiling consisting of ceiling panels supported by a metal framework or "grid" hung from the existing ceiling structure or joists by wires. The grid is installed by nailing L-shaped metal molding to the walls of the room at the desired ceiling height. Hanger wires are then attached to the joists at 4-ft. intervals, and the suspended ceiling main runners are fastened to the hanger wires.

"Gridmate" units—new 4-ft., two-lamp

A NEW BREED OF INSULATION BOARD, Barrett TF 310 (Technifoam), is a core of rigid urethane foam with paper facer sheets on either side. It can be nailed to studs, attached with metal fasteners in metal construction, or nailed to furring strips in masonry construction. It can be finished with most covering materials that apply with adhesive. TF 310 is available in 1/2, 3/4 and 1-in. thicknesses



TECHNIFOAM BOARD cuts easily with ordinary pocket knife



ATTACH BOARD to furring strips or studs with nails and roofing washers



URETHANE provides twice the insulation of other materials



ADHESIVE is applied to covering material (wallboard)



NAILS HOLD wallboard up until adhesive sets (24 hrs.)

fluorescent fixtures that reflect 35 percent more light than standard strip lights—are then installed directly to the ceiling structure above the grid.

Finally, removable translucent panels are inserted into the grid beneath the fixtures. The result is a luminous ceiling emitting softly diffused light from invisible fixtures. Such an installation can be made in the average 12x15-ft. room for \$60 to \$90 exclusive of the luminous panels, which run 50 to 75 cents per sq. ft.

Maybe you've finally decided to put some new siding on your house. Congratulations! How about vinyl siding? Sure, we know, 8-in.-wide vinyl siding came down the pike a few years ago. But vinyl siding in a 6-in. width is new. A Monsanto product, the siding nails directly to standard sheathing, eliminating the necessity of a special backerboard. A novel nailing tab acts as a built-in spring that insures a secure but "floating" suspension of each siding course. Nailing holes are slotted to permit the siding to expand and contract during extremes in temperature. The siding does not require paint and will not chip, dent or rust.

A new breed of insulation board has just been introduced by the Barrett Division of Allied Chemical Corp. Called Barrett TF (for Technifoam) 310, the board is comprised of a core of rigid urethane foam with paper facer sheets on both sides. It provides as much insulation as other insulating materials twice as thick. The home handyman can use it to insulate basement, attic and other areas without breaking into walls. The material can then be topped with any finished surface desired.

Providing maximum insulation with minimum thickness, TF 310 can be used to special advantage in such places as attics and basement rooms where space is at a premium.

So there you have a brief sampling of just a few of the new home-improvement products and materials now available to homeowners. A visit to your local hardware store and lumber dealer will introduce you to dozens more. And if you're a guy who does his own home maintenance and remodeling, it's a visit well worth making. ★ ★ ★

Army's high-speed printer

A high-speed electrostatic printer that can reproduce 2000 five-color maps an hour from 70-mm. microfilm has been developed by the Army. It's mounted in a mobile van and is designed to provide detailed maps for troops in the field.

SEPTEMBER 1966

Basic in any tool kit...



Swingline® 800 HEAVY-DUTY TACKER GUN

**Hundreds of uses
indoors and out:**

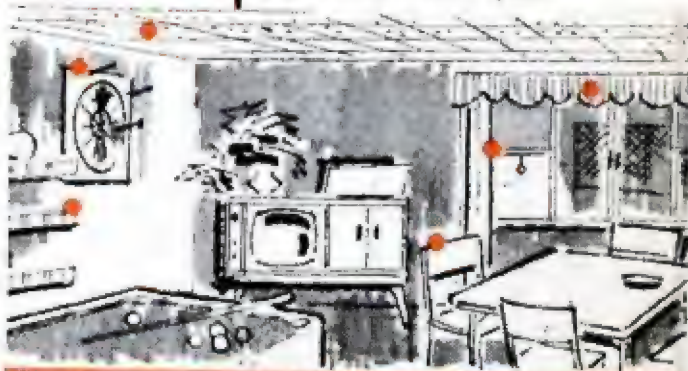
- Ceiling tiles
- Upholstering
- Shelf trimming
- Valances
- Window shades
- Fencing
- Insulating
- You-name-it!

A real precision heavy-duty gun! Easy action handle... exclusive "Power Dot" for greater staple penetration... handle lock... built-in staple extractor... takes 5 staple sizes plus special Loktile® staples for ceiling tile installation.

\$7.95
at all hardware, department, variety, stationery stores. ONLY

800-X Chrome
Heavy-Duty Tacker Gun \$8.95

101 High Compression Tacker Gun.
Takes 2 staple sizes. \$4.95



Swingline® INC.

32-05 SKILLMAN AVENUE, LONG ISLAND CITY, NEW YORK 11101
WORLD'S LARGEST MANUFACTURER OF STAPLES FOR HOME AND OFFICE

OVER
300
DIFFERENT
MOLDS

you can use to
make and sell
YOUR OWN
ORNAMENTAL
CONCRETE ITEMS



Get
The Full Story



SEND 1-2

CONCRETE MACHINERY COMPANY, INC.
839 Lenoir Rd. - P. O. Box 99 - Hickory 2, N. C.

HOME WORKSHOP ARC WELDER!



ELECTRIC
WELD BRAZE,
SOLDER, CUT
ALL METALS



New Twin Model

LIFETIME BURNOUT GUARANTEE—10 day money back trial. Works on any 110 volt "Plug in". Welds up to 1/4" steel with 1/16" to 3/8" rods. EXTRA Special twin pressure type arc torch shown develops up to 10,000 deg. heat—HAS A MILLION USES—for CARS—HOME—FARM—FACTORY. No experience needed—FREE Welding book teaches YOU. Thousands of users. SEND ONLY \$2.00 (cash, Ck, MO) and pay postman \$12.95 COD Pkg. or send \$14.95 for postpaid delivery in USA. COMPLETE ready to use with 12 ft. H.D. cables, Arc torch rod holder, carbons, welding and brazing rods, flux solder, work clamp and full face mask. FREE EXTRA "Buck" eye goggles in your order at once. This BEST FOR THE MONEY welder sold ONLY by MIDWAY WELDER, Dept. DPM-9, Kearney, Nebr.

THE BEST KNOWN IS KNOWN BEST



FOR
REMOVING
PAINT



STRYPEEZE Semi-Paste is a non-benzol, general purpose paint remover, that clings to rounded or vertical surfaces.

STRYPEEZE Semi-Paste will not raise wood grains... is not harmful to natural fibers. Available where paint is sold.

QUALITY PRODUCTS SINCE 1875

SAVOGRAN

Addison, Ill. NORWOOD, MASSACHUSETTS Los Angeles, Cal.

SILVER DOLLAR SPECIALS!

Brilliant Uncirculated Condition



One Coin\$ 3.00
Three Different\$ 8.00
Five Different\$13.50
Ten Different\$25.00
Twenty Different\$45.00
Twenty-Five Different \$60.00

Immediate shipment, postage and insurance paid, satisfaction guaranteed or your money back.

SUBURBAN COIN CO., INC.
607-G Mesquite, Corpus Christi, Texas

FALSE TEETH

That Loosen
Need Not Embarrass

Many wearers of false teeth suffer embarrassment because their plates drop, slip or wobble at just the wrong time. Don't live in fear of this happening to you. Just sprinkle a little **FASTEETH**, the alkaline powder, on your plates. **FASTEETH** holds false teeth firmer so they feel more comfortable. Checks "denture breath." Dentures that fit are essential to health. See your dentist regularly. Get **FASTEETH** today at all drug counters.

'66
FORD,
DODGE

\$999

'65 CHEV.
\$799

'65 FORD,
DODGE \$699

LATE MODEL
CARS AT HALF PRICE!

4-dr., 6-cyl., autom. trans., new tires, spare, heater. Ex-taxis. No signs or markings. Present appearance no different than regular passenger cars.

FREE CATALOG

Write, wire,
call, visit.

UNIVERSAL AUTO
WHOLESALE, INC.

235-29 Penhorn Ave., Secaucus, N.J. 07094
Phone (201) 866-7500 or (212) 244-1580

33 YEARS IN BUSINESS AT THE SAME ADDRESS

NOWHERE CAN SUCH QUALITY
BE FOUND AT SUCH LOW PRICES!

We Bought Tires by the Truck Loads—
TO SAVE YOU MONEY

LOOK FOR MILEAGE—BUY NOW

AT DISCOUNT PRICES

Our entire stock of very slightly worn
DEEP TREAD TOP GRADE Tires.



| | | | | | | | |
|-----------|------|--------|------|--------|-------|---------|----------------|
| 650x16 | 4.15 | 850x14 | 4.15 | 800x15 | 4.15 | 825x20 | 18.05 |
| 600x16 | 4.15 | 800x14 | 4.15 | 820x15 | 4.15 | 900x20 | 19.05 |
| 600x16(8) | 6.55 | 850x13 | 4.15 | 700x17 | 8.75 | 1000x20 | 19.05 |
| 650x16(8) | 7.15 | 870x15 | 4.15 | 750x17 | 10.05 | 1100x20 | 19.05 |
| 750x14 | 4.15 | 710x15 | 4.15 | 750x16 | 9.05 | 1000x22 | 19.05 |
| 800x14 | 4.15 | 760x15 | 4.15 | 700x16 | 8.05 | 1100x22 | 19.05 |
| 640x15 | 4.15 | 650x15 | 4.15 | 750x20 | 12.05 | | Dealers Wanted |

SNOW TIRES

\$5.75
ea.

ORDER ANY
PASSENGER
TIRE

Thousands of tires shipped all over the U.S.A. All tires shipped F.O.B. Phila. Send Check or M.O. with this ad. Dept. 5. No C.O.D.

STANDARD 834 N. Broad St., Philadelphia 30, Pa.

POWERFUL NEW INVENTION, ONLY 2" LONG
SHOOTS THRU 100
PAGES-THIS BOOK!

'B-B SHOT'



MAKE THIS TEST... Load your 'BB Shot' and fire against this magazine. Notice that it drives BB's through more than 100 pages. Though only 2" long x 1" in diameter, this pocket-size device has amazing power and accuracy. Use it for targets, pests and hunting. Scientifically designed for high power, operating ease and safety.

FREE! Get the 'BB Shot' now—we'll include an extra Velocity Cone and FREE Target, BB's and Automatic BB Dispenser... all for only \$1.98 ppd. 3 for \$5.00 ppd. Money Back Guarantee. Not sold to N. Y. C. residents or minors

GRAYSON CO. • Dept. C-31, 210 Fifth Ave., N. Y. 10

**MONEY-BACK
GUARANTEE**

Name.....
Address.....
City..... State.....

\$1.98
ppd.

TUNE UP ELECTRONICALLY ANY CAR EVER MADE...

domestic or foreign; compact or limousine; 4 cylinder, 6 cylinder or 8 cylinder; 6 volt or 12 volt.

With New
Improved
Model BT-162

DWELL TACHOMETER



NOTE:
GIANT 6½"
METER FOR
EASY,
ACCURATE
READINGS

At last a streamlined instrument designed to provide the most important services for "tuning up" any and every car ever made from a Model A Ford up to and including the current automatic transmission cars produced today.

The Model BT-162 includes the very latest design Dwell Meter, working in conjunction with a dual range Tachometer and incorporating all modern improvements in circuitry design.

Assure easy starts, optimum performance and maximum gas economy with Model BT-162.

The Model BT-162 will perform the services specified below in addition to many other tasks too numerous to mention:

- Assure precise adjustments of points that are slightly worn or pitted.
- Indicate the most effective point setting without removing the distributor cap.
- Indicate the correct settings for external adjustment type distributors. (A feeler gauge cannot be used for making correct adjustments on this type of distributor since many manufacturers' specifications do not list the point gap in inches. They list only the dwell angle in degrees.)
- Insure maximum gas economy and quiet engine running. Read the exact RPM while the engine is in neutral position. Then adjust the carburetor in conformity with the car manufacturer's recommendations.
- To locate a "miss" you need only disconnect or "short" the spark plugs one at a time with the Model BT-162 switched to the Tachometer position.
- Cars with automatic transmissions function efficiently only if the fluid pressures are correctly maintained and since manufacturer's instructions always refer to RPM, the Model BT-162 (or an equivalent tachometer) is required to properly service automatic transmissions.

The Model BT-162 is the most complete unit in its price range ever produced. It comes absolutely complete, ready to use. Only

\$29⁹⁵

SEND NO MONEY WITH ORDER PAY POSTMAN NOTHING ON DELIVERY

Try it for 10 days before you buy. If completely satisfied then send \$5.00 and pay the balance at the rate of \$5.00 per month until the total price of \$29.95 (plus small P.P. and budget charge) is paid. If not completely satisfied, return to us, no explanation necessary.

ACCURATE INSTRUMENT CO., INC.

Dept. D-464, 2435 White Plains Road, Bronx, N.Y. 10467

Please rush me one Model BT-162. If satisfactory I agree to pay \$5.00 within 10 days and balance at rate of \$5.00 per month until total price of \$29.95 (plus small P.P. and budget charge) is paid. If not satisfactory, I may return for cancellation of account.

Name _____

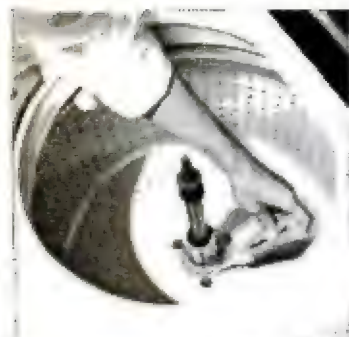
Address _____

City _____ Zone _____ State _____

☐ Save Money! Check here and enclose \$29.95 with this coupon and we will pay all shipping charges. You still retain the privilege of returning after 10 day trial for full refund.

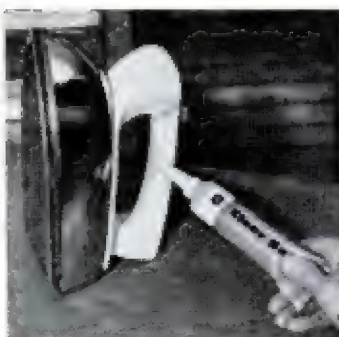


"Silicone Seal saved me a \$25 repair job..."



"... Over six months ago, I used it to fix a ripped rubber seal in our washing machine. No leaks since. Saved \$25 replacement cost."

H. C. Bellman
San Fernando, Cal.



"Repaired a broken iron handle with Clear Silicone Seal. It wears and wears. Also repaired a broken lamp. I wouldn't be without it."

A. Zubuss
Philadelphia, Pa.



"I used Silicone Seal to cushion the noise of sliding closet doors. Placed dabs near top and bottom to stop bumping and rattling."

B. Crampton
North Kingstown, R. I.



"After trying every other caulk without success, and replacing tile over the tub four times, we finally solved our caulking problem with Silicone Bathtub Seal."

G. E. Dawes
Owatonna, Minn.

SUPER GLUE! Silicone Seal bonds to glass, ceramic, wood, metal, fabric, leather and other hard-to-glue materials.

PERMANENT CAULK! Silicone Seal is permanently waterproof and flexible, won't crack or shrink. Use indoors or out.

"DO-IT-YOURSELF" RUBBER! Silicone Seal makes flexible door bumpers, protective strips, gaskets, noise and vibration dampeners.

FOUR COLORS. Transparent, white, aluminum, black.

Tell us about your unusual use for Silicone Seal. If we use it in ads, we'll pay you \$10. All ideas become our property. Write: Section BS-9197R, Silicone Products Department, General Electric Co., Waterford, N. Y.



3 oz. and 1 oz. tubes.

GENERAL ELECTRIC

CORRESPONDENCE SCHOOL

(Continued from page 98)

jabbed button one or three heard what the right answer should have been, then received a brief but comprehensive review of the purpose and implications of company policy.

Missing a broadcast isn't serious. Each lesson is repeated two days in a row. On Sundays, starting at 9:00 a.m., the preceding week's lessons are repeated all day. As long as a student is within 30 miles of Philadelphia's center, the range of the FM station, he can pull in lessons. The special radio designed to receive these broadcasts is battery-powered. It is loaned to students for the duration of the \$50 course. After the last broadcast, each student takes a final examination, which is mailed to him, and he returns it to ICS.

The idea of radio correspondence schools caught on immediately. The Philadelphia modern-management course is a pilot project designed to work out administration hitches and, therefore, is limited to just 100 people. Yet, only a few advertisements over WFIL, the FM station broadcasting the lessons, brought in more than 1000 inquiries. Right now, the school is designing five additional courses for broadcast over FM stations throughout the country by January, 1967.

The idea of Educating doesn't stop with radio. Closed-circuit experimental courses in some high schools with TV have been tried with encouraging results. In this case, after the instructor presents a portion of the lesson and asks a question, the TV screens divide into four quadrants, each quadrant having its own symbol. When a student presses one of four buttons, one quadrant on his screen shows the instructor—confined to that quadrant—elaborating on the response.

The possibilities for dramatizing instruction with this method are enormous. At the University of Tulsa, a pilot law course shows actual courtroom scenes. In one case, the prosecutor, questioning a key witness, suddenly asks for an important but tangential bit of information. Then the scene stops and the instructor comes on, pointing out the different tactics a defending lawyer could adopt. Each student then chooses what he believes to be the correct strategy to follow. The quadrant on the TV screen corresponding to his selection then covers the response.

No one claims that Educating—by radio or TV—takes all the effort out of learning. But ICS does hold that by handing students an active role in acquiring an education, knowledge and new skills can be learned faster than ever before. ★ ★ ★

FREE!

Mail This Card Today For Your
FREE
1967 Lafayette Catalog 670

LAFAYETTE 1967 Catalog 670



*Now
BETTER
THAN
EVER*

Over
500
Pages

Featuring Everything in Electronics for
• HOME • INDUSTRY • LABORATORY
from the
"World's Hi-Fi & Electronics Center"

Use Lafayette's Easy-Pay Budget Plan
No Money Down... Up to 24 Months to Pay
Satisfaction Guaranteed or Money Refunded

STORE LOCATIONS

NEW YORK

Bronx
Brooklyn
Jamaica
Manhattan
Scarsdale
Syosset

NEW JERSEY

Newark
Paramus
Plainfield
MASSACHUSETTS
Boston
Natick
Saugus

(WASH. D.C. AREA)

Falls Church, Va.
Mt. Rainier, Md.

CONNECTICUT

Hamden W. Hartford

PENNSYLVANIA

Pittsburgh

Mail the Coupon Today for Your **FREE** 1967
Lafayette Catalog 670



Name

Address

City

State

Zip

Dept. LI-6 (Please Give Your Zip Code No.)

Mail This Card Today for Your Friend's
FREE
1967 Lafayette Catalog 670



Friend's
Name

Address

City

State

Zip

Dept. LI-6 (Please Give His Zip Code No.)

LAFAYETTE Radio ELECTRONICS

Dept. LI-6 P.O. Box 10

Syosset, L.I., N.Y. 11791

Send me the Free 1967 Lafayette Catalog 670

Name

Address

City

State

Zip

(Please Give Your Zip Code No.)

Live Better Electronically With

LAFAYETTE RADIO ELECTRONICS

Mail The Card Today for Your

FREE!
1967 Catalog 670



**Shop At The
"World's Hi-Fi &
Electronics Center"**
For Widest Selection,
Low Prices

Stereo Hi-Fi • Citizens
Band • Ham Gear •
Tape Recorders • Test
Equipment • TV and
Radio Tubes and Parts •
Cameras • Auto Acces-
sories • Musical Instru-
ments • Tools • Books

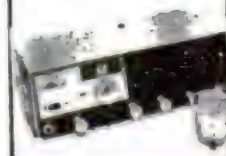
**Everything In Electronics For
Home • Industry • Laboratory**

Exclusively Yours at Lafayette

A Complete Assort-
ment of Musical
Instruments



25-Channel,
Solid-State C.B.
Transceiver
Model HB-600



New! Criterion Hi-Fi
Bookshelf Speakers



No Money Down • Up to 24 Months to Pay

New 65-Watt AM-
FM Solid-State
Stereo Receiver,
Model LR-900T



New! 2-Channel
6-Transistor
Walkie-Talkie
Model HA-62



New! All Solid-State
Tape Recorders and
Decks—Model RK-830



Satisfaction Guaranteed or Money Refunded

Lafayette
Mobil-Ade™ 12-
Channel Solid-State
CB Transceiver,
Model HB-555



50-Watt Solid-State
Stereo Amplifier,
Model LA-248



New Complete Line
of Lafayette
TV Antennas



Do A Friend A Favor...

Have a friend interested in hi-fi or electronics?
Send us his name and address and we will send
him his own personal copy of the 1967 Lafayette
Catalog 670.

FREE! MAIL THE CARD TODAY

PLACE
STAMP
HERE

PLACE
STAMP
HERE

LAFAYETTE RADIO ELECTRONICS
P.O. BOX 10
SYOSSET, L.I., N.Y. 11791

LAFAYETTE RADIO ELECTRONICS
P.O. BOX 10
SYOSSET, L.I., N.Y. 11791

UNIQUE VACUUM PLATE

(Continued from page 164)

The shallow crisscross grooves shown within the small O-ring groove theoretically increase the surface area and thereby help produce a greater vacuum. These are formed with a ball end mill and extend to about $\frac{3}{16}$ in. from the ring groove and to the very edge of the tiny suction hole. It's best to drill the latter now than to wait until after the piston hole is bored. You won't have a burr in the piston hole and there will be less chance of drill breakage.

Next, the block is set on edge on a vertical milling machine for boring the piston hole. This is centered in the thickness of the block, lapped after boring and finally tapered with a No. 3 Morse taper reamer. Holes are drilled and tapped on each side of the piston hole for an end plate. Note that the center hole in it for the piston handle is cross-slotted to admit a cross pin which bears against the face of the plate to hold the piston in its locked position.

The piston itself is turned from drill rod following the detail. Make its diameter about 0.010 in. smaller than the bore so the rubber O-rings will make

full contact with the bore when the piston is in place. A small amount of light grease is placed in the grooves of the piston before the O-rings are added. Assembly is completed by inserting the piston, attaching the end plate and fitting a knob to the handle end of the piston.

One final step in making the plate is to drill and tap a row of holes along opposite edges for two parallels. These are $\frac{1}{2}$ -in.-wide metal strips which serve to keep the work from moving laterally, as well as to hold it more rigidly for a greater bite in the removal of stock. The strips are placed on each side of the work and fastened with small machine screws. ★★

When north was south

If a prehistoric man of more than 850,000 years ago had had a compass, it would have pointed south instead of north. Then, the magnetic polarity of earth reversed, leaving the original magnetic pole frozen in hardening lava that is now sea bottom. By measuring the depth at which the polarity change appears in some 400 bottom core samples, Dr. Norman Watkins of Florida State University hopes to find the age of the Antarctic Ocean floor.



NEW... outstanding variable power **WEAVER SCOPES**

Designed for the shooter who wants the last word in sighting versatility... the light, compact 2½x to 7x Model V7 and the big, bright 3x to 9x Model V9 both offer instant choice of magnification for all kinds of shooting at short or long ranges. Crosshairs are constant-size, always centered. Optics are sharp and brilliant; adjustments are internal and guaranteed accurate. American craftsmanship, sturdy construction, complete sealing and nitrogen processing assure dependability. See them at your dealer now... V7 for \$62.50, V9 for \$69.50.

©1966 W. R. Weaver Co.

FREE 40-page full-color catalog

NAME _____

ADDRESS _____

CITY _____

STATE _____

ZIP _____

W. R. WEAVER CO. Dept. 91 / El Paso, Texas 79915

500 EGGS IN ONE BASKET

(Continued from page 69)

the ground during loading and unloading.

Engineers say that the jumbo jets will be so foolproof that it will be difficult for a pilot to make an error. In fact, for most routine operations the pilot will monitor the controls instead of handling them.

Landings will be semiautomatic, with the radio landing system coupled to the automatic pilot. An automatic flare system will bring the plane into its landing attitude when 50 feet above the runway.

To speed loading, passengers will assemble in four waiting rooms instead of one and will enter the cabin through four double-width doors. Baggage will be routed from the plane to the claim areas on high-speed conveyor systems.

This brand-new development in air travel stems from what's called the "C-5A technology." The C-5A is a monster transport that the Air Force has ordered, for carrying more than 100 tons of cargo farther than 3000 miles at 550 mph. Engine manufacturers have been developing its powerplants. Boeing, Douglas and Lockheed designed their own versions of the C-5A, with each design incorporating the latest knowledge in high lift-wing devices and other improvements. Lockheed won the military contract and is building 58 of the transports. The first will fly in less than two years.

Here's a capsule description of the C-5A: It will be 245 feet long, almost 100 feet longer than the present big 707 airliner, with a wingspan of 222 feet. The top of its tail will be 65 feet above ground.

The plane has 28 wheels to allow it to land and take off at unimproved fields. After being parked, it can "kneel down" for unloading.

Its cargo compartment (19 feet wide and 121 feet long) can house a mixed cargo such as a large helicopter, a tank, an intermediate range missile and an assortment of trucks and jeeps, plus all the crews and maintenance personnel.

Big on power

The plane will be powered by four "high bypass" fanjets that develop 41,000 pounds of thrust apiece. Basically, a fanjet is a turbojet that uses much of its power to spin a large-diameter fan attached to the front of the engine. The fan blows more air back around the outside of the engine than flows through it. This bypass principle creates more thrust at the same time that it reduces specific fuel consumption.

The new fanjets have a bypass ratio of eight to one, four times greater than in

present fanjets, and are considerably more efficient. They are big engines. The fan is more than eight feet in diameter.

Each of the companies that competed for the C-5A contract knew that huge airliners were going to be needed sometime in the future. The date depends on how fast the volume of air travel grows and on how many passengers the upcoming supersonic transports will steal from the subsonic jets. The companies knew, too, that with some modification and possible reductions in size, their C-5A designs would be ideal for subsonic airliners.

Each is "ahead"

This is a case where each of the companies, one way or another, has gotten the jump on its competitors. Lockheed won the military contract and Boeing got the first order for a supersized airliner. Douglas, in the meantime, is making hay with its DC-8 Super 61, the largest airliner now flying. The Super 61 carries as many as 251 passengers versus 189 in the standard model. Airlines have ordered 73 of them recently and Douglas is prepared to "stretch" the design to 350-passenger capacity when the high bypass fanjets are available. Beyond that, the company would jump to its proposed two-deck 550 passenger jumbo DC-10.

Douglas is telling the airlines that its two-deck design is the most efficient for either passengers or cargo, that the DC-10 would cruise at Mach .9 (about 650 mph) and that seat-mile costs would be about 25 percent less than in existing jets. (Its competitors say that two decks would create unnecessary loading problems at the terminals and a serious problem if ditching was necessary.)

Boeing says that its design, with up to 450 passengers on a single deck in a longer fuselage is best. (Its competitors say that the skin surface per passenger is greater, hence the design is less efficient.)

Lockheed is saying that the basic C-5A would make the best passenger transport of all, after rearranging the interior to accommodate 750 passengers or more. Costwise, this would save many millions in extra engineering and tooling. (Its competitors say *their* versions are much faster, that the C-5A high wing is inefficient for commercial operations and that it will be a long time before 750-passenger aircraft are needed.)

Arguments like these are normal in the aircraft industry and in the long run it's the public that profits from them.

The fast and inexpensive transportation made possible by the jumbo jets will completely alter the transportation industry. ★★

How can UNIMAT be exciting if it bores?



Simple. It also mills, drills, grinds, polishes and more. That's UNIMAT, a miniature machine shop that operates both as a precision lathe and multi-functional tool on metal, plastic and wood. Converts in just seconds. Only 17" long. UNIMAT has satisfied thousands of exacting hobbyists with its versatility and tool-room accuracy (up to .0005"). Performs like costly big equipment while taking up a minimum of space.

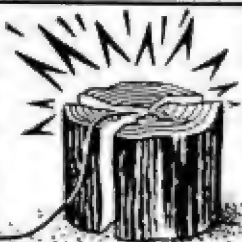
No prior experience is necessary to use this valuable tool. The basic unit plus lots of extras sells for \$139.50. Send for free literature. Add \$1.00 and get the whole story in "Miniature Machining Techniques", a 40-page photo-packed manual.

Write: American-Edelstaal, Inc., Dept. G-16, 350 Broadway, New York, N.Y. 10013.



FREE FUSE!

SPLIT GIANT LOGS
QUICKLY—EASILY
SEND 20c FOR DETAILS
NITRO-POWER
BOX 83275, DEPT. M 96
LOS ANGELES, CALIF. 90072



FREE!

WORLD'S LARGEST ELECTRONIC KIT CATALOG!



108 colorful pages ... illustrate over 250 kits for space-age fun at 50% savings. Build your own stereo system, color TV, electronic organ, portables, marine electronics, ham and shortwave radio, plus many more. No special skills or knowledge needed. Find out how easy it is ... mail coupon for your FREE copy!

Heath Company, Dept. 17-9
Benton Harbor, Michigan 49022
Please send FREE 1967 Heathkit Catalog.

Name _____

Address _____

City _____ State _____ Zip _____

CL-248

Weller® SOLDERING GUN KITS



for the
homecrafter who's aiming
at **PERFECTION**

Get *fast* professional results on hobbies and home-repair jobs with the guns preferred by electronics manufacturers. Just squeeze the trigger and you get instant high or extra-high heat plus prefocused spotlight. Get the one you want from your hardware dealer:

Weller Heavy-Duty Dual-Heat Soldering Gun Kit Features Weller heavy-duty 240/325 watt dual-heat gun with twin spotlights plus extra cutting and smoothing tips (for thermoplastics, tile, etc.) tip-changing wrench, 60/40 rosin core solder and "Soldering Tips" manual—all contained in rugged plastic case. (Gun ~~\$12.95~~ alone is \$8.95.) Kit Model D-550 PK only: **\$12.95** list

Weller Dual-Heat Soldering Gun Kit Includes 100/140 dual-heat gun with single spotlight, three copper soldering tips, wrench, flux brush, soldering aid tool, 60/40 rosin core solder and "Soldering Tips" manual in plastic case. ~~\$8.95~~ (Gun alone is \$6.95.) Kit Model 8200PK **\$8.95** list

WELLER ELECTRIC CORP., Easton, Pa.
WORLD LEADER IN SOLDERING TECHNOLOGY

Only the world's finest automotive parts are privileged to bear this seal of quality!



**Famous NAPA BRANDS used
by SERVICE REPAIR SHOPS
to give YOUR car the best service**

MAC'S Automotive
Chemicals
and Polishes

BALKAMP

Functional Parts, Equipment,
Supplies and Accessories
for Car, Shop and Home

Belden

Wire and Cable
IRS Ignition Sets

ECHLIN

Ignition — Switches
Carburetor Parts

MARTIN-SENOUR

Shop Engineered
Refinishing Products

Allied

Engine Parts

BRIDGEPORT

Tire Valves & Accessories

Federal

Needle Rollers
Radial Clutch Release Bearings
Straight Roller Bearings

Micro Test

Timing Gears,
Chains & Sprockets
Matched Gear Sets

American Brakeblok

America's Safety Brake Lining

Soundmaster
PREMIUM
LIFE **Mufflers**

FLEET

SERVICE EQUIPMENT

Modac

Belts & Hose

Quality Automotive Parts Superior Service

NAPA[®]

The NAPA seal of quality distinguishes the finest replacement parts for your car. For your convenience, a nationwide distribution network of 52 great NAPA Warehouses, backed by over 4000 NAPA Jobbers, puts these famous products in the hands of your local repair man.

You can be sure of good starts, safe stops and driving comfort when you put your car in the competent hands of a professional mechanic who cares enough to use the best—NAPA Quality Parts. NAPA—29 East Madison Street, Chicago, Ill. 60602.



Allied[®]

Chassis Parts

Regal-Ride

Shock Absorbers &
Load Levelers[®]
(Stabilizing Units)

Spicer

Universal Joints & Repair Kits
Power Take Offs & PTO Joints
Monmouth Clutch Plates

MicroTest

Automatic Transmission Parts
Power Steering Parts

MONMOUTH
ENGINE BEARINGS

Rockford
Fasteners •
Nuts • Bolts

THOMSON
Thermostats

Victor
GASKETS • OIL SEALS

New Britain
Mechanic's Hand Tools

Soundmaster
TRUE FIT EXHAUST
ACCESSORIES

TRICO
Windshield Wiper Blades
Arms, Motors, Linkages,
Hose, Washers, Solvents

Visall
Truck Safety Equipment
Lights • Mirrors • Reflectors

IDITMER
Transmission Gears—Shafts
and Overdrive Rods

MARTIN SENOUR
Lacquers and Acrylics
in Fresh Coat

UNITED
Brake Parts & Brake Fluid
Speedometer Cables

WEATHERHEAD
BRASS
FITTING • END • COUPLER

In the driver's seat of:

The Frantic Fitch Phantom

By ALEX MARKOVICH

WHAT HAPPENS when a well-known racing driver reworks a front-wheel-drive Oldsmobile Toronado to suit his kind of driving? To find out, I paid a visit to John Fitch at his bustling garage in Falls Village, Conn. There I picked up his newly designed Phantom, a gung-ho Toronado with \$2000 worth of performance and luxury extras, and gave it a road test.

Fitch is a tall, modest, personable man who looks younger than his 48 years. If you follow car racing, you've heard of him. For the past 18 years he has been driving for the Mercedes, Cunningham, Ferrari, Maserati, Jaguar and Porsche factory teams and taking class or overall wins at such top races as Le Mans, the Mille Miglia, Sebring, and the Argentine Grand Prix.

For several years he has been modifying Corvairs on special order through Chevrolet dealers. Called the Sprint, this package features controversial body restyling, more power and greatly improved handling. (Just this summer he announced another luxury sports car, the Phoenix, with a Corvair engine and power train.)

Back to the Phantom. If you want to buy one, you first make a deal with your Olds dealer. (Toronados start at \$4600 list.) The car is sent from the factory directly to Fitch, who—for an extra \$2000 or more—turns it into an honest-to-goodness luxury Grand Touring car.

What do you get for your money? The Phantom doesn't look too different from the un-Fitched version: There's a mean-

looking blacked-out grille, a couple of extra lights in front, and an unusual two-tone paint job that makes the already-sleek car look as if it's crouching. Most of the changes are in the cockpit, engine and running gear.

Climb in and you feel as if you're in a \$13,000 foreign GT car—except for all the room. An extra panel on top of the dash holds a diminutive tachometer, a button that switches on a fog light built into the front bumper, and a spring-loaded lever that flashes an 80,000-candlepower driving light, also in the bumper. A toggle switch on the left side of the dash makes the driving light go on whenever headlights are on high beams. The driving light is also wired to flash each time you blow the horn—an effective long-range warning at crossroads and when passing.

The steering wheel wears a snugly laced leather cover that provides a nonslip grip and stays cooler in the summer and warmer in the winter. The small plastic shift-lever knob is replaced by a huge wooden handle.

A close inspection of the dash reveals still more switches hidden in the most unlikely places. A couple of them operate electric motors inside the front seats that direct cool air through the perforated upholstery. The motor on the driver's side seemed to be ailing; when started from cold, it was noisy and, what's worse, it vibrated. The feeling I got when I sat on it

(Please turn to page 205)

LOW, SLEEK AND DOWNRIGHT MEAN is Fitch's customized Toronado, a \$6500-plus beauty that really goes



FRANTIC FITCH PHANTOM

(Continued from page 198)

is . . . well . . . uh . . . odd.

I noticed three little colored lights blinking at me from under the dash. Fitch explained that the red one warns that a headlight, taillight or stoplight is burned out or malfunctioning. The yellow one tells you when the stoplight switch is energized. The green one just reassures you that all systems are go. Then there's a handy map light on the dash, and a map tray that slides from under the seat.

Time for the shakedown run. I twisted the starter key and the engine fired up with a throaty growl. The only engine modifications are a straight-through exhaust system, a low-restriction air cleaner and an electronic magneto ignition. Fitch says horsepower is raised from the stock 385 to 405. I was skeptical, but my acceleration figures later bore him out.

Handling is most impressive

The most impressive feature of the Phantom is the handling. All six stock shock absorbers are replaced with Koni heavy-duty, adjustable shocks. Also contributing to adhesion are eight-inch-wide wheel rims and large radial-ply tires. Even in the most vicious corners, I could sense no lean whatsoever. Just a nice, reassuring understeer under hard throttle, changing to nearly neutral steering with the throttle backed off. You hardly know you're driving a front-drive car until you hit a really bad road surface; and that's where the inherent stability of front drive shows up best. I wouldn't have believed that the Toronado's already fine handling could be improved without hurting the ride, but Fitch has done it.

Steering and brakes have better feel

because of a reduction in power boost to each. The stock Toronado steering ratio is quite fast, and Fitch left it unchanged in the Phantom. The stock brakes, however, tend to fade during hard usage, so sintered-metallic linings are installed on the Phantom. Not only do these provide better stopping, they also last longer.

Fitch has made some handy modifications to the shifting mechanism. First he modified the detents. In the stock Toronado, Super and Low ranges are in the same slot, making it difficult to shift from Drive to Super without overshooting to Low. Here, Drive and Super are in the same slot, and I could shift quickly back and forth without looking at the quadrant.

Even more interesting is the plastic switch on the shift lever that controls stator-blade angle. Flick the switch back and stator-blade pitch increases to give the effect of lower gearing; push the switch forward and the pitch decreases like a manually controlled overdrive. Thus four useful ratios are available manually.

Doesn't feel big

The car is a pleasure to drive. Though flooring the throttle results in an exciting power roar, the engine is quiet under steady throttle, even at high speeds. My test car was loaded with options—air conditioner, power windows, radio—that made driving relaxing. Most unusual of all, the Phantom just doesn't feel like a big car.

I concluded my tests with the acceleration runs, first hooking up the fifth wheel, a device that gives speed readings calibrated to within .001 mph. I was immediately aware of a problem:

I had to feather the throttle carefully to avoid wheelspin coming off the line. In a road test of a stock Toronado (PM, December 1965) we had to work hard to induce wheelspin.

With the transmission in Drive, 0-60 averaged 8.0 seconds in the Phantom. Shifting manually at 5000 rpm resulted in exactly the same time, and revving higher actually hurt performance. The stock Toronado we tested needed 9.4 seconds to reach 60. But perhaps the comparison isn't quite fair, since the car had just completed 3000 hard cross-country miles and wasn't in the best tune. The Phantom did 40-60 in 4.4 seconds and 50-70 in 4.8, versus 4.6 and 5.6 seconds respectively for the stock Toronado.

All in all, the Phantom is an exciting and satisfying car that leaves little to be desired. Fitch's plan to build 500 of them by the end of the year is certainly ambitious. But I think he might just sell every one of them. ★★★



EXTRA DASH PANEL houses tach, fog-light switch and driving light flasher. Wheel has laced leather cover

DON'T PAINT UNLESS...

You have EASY-MASK, the exclusive green, 2 in 1 extra wide masking paper and tape, that speeds up painting, eliminates the mess.



GET FREE
"88" PAINTING
IDEAS BOOKLET



DAUBERT CHEMICAL CO.
2000 Spring Road Department PH 9
Oak Brook, Illinois 60523

EVERLITE* World's THRIFTIEST Light Plants



THE CHAMPION

\$144.50

The Champion — 1200 watts 115 volts AC for only \$144.50. Unbelievable but true—Brand new production methods now make possible world's finest design in a service free alternator light plant at this unprecedented price. Plant puts out a steady 1200 watts of 115 volt AC power to run power tools, oil burners, pumps, TV, or anything that requires up to 1200 watts. Powered by a rugged 3 HP, 4 cycle, easy start gas engine with 1 year factory warranty. Complete with carry handle and shock mounts. Why fool with short life 2 cycle plants when you can buy this rugged top quality machine at our factory price.

Item # 1265 wt. 85 lbs. \$144.50

MASTER MECHANIC MFG. CO., Dept. A-96 Burlington, Wis.
Southern Customers Write to Dept. A-96, Box 65, Sarasota, Florida

SPEEDY RIVETS JUST SWAT WITH A HAMMER

SPEEDY RIVETS are ideal where quick, sure riveting jobs are needed. Instant fastening for leather, cloth, paper, cardboard, light gauge metal and plastic... 1001 uses. No special tools required... works like a charm! Available at most hardware dealers in large or small size... nickel, gilt, black or brown. Or, write for name of nearest distributor.

**COLUMBIA
FASTENER**

SUBSIDIARY OF UNITED-CARR
3229 S. Ashland Avenue • Chicago, Illinois 60608

FUEL MIXES

(Continued from page 159)

mixture, accidentally or otherwise. Carbon can build up and begin to glow red-hot. As we said, this leads to preignition. In addition, exhaust ports can plug up because of excess carbon, allowing internal temperatures to soar. Sparkplugs can foul which can lead to hard starting, rough idling and a powerless engine.

One operating condition which indicates an oil-rich mixture is excessive smoking from the engine at idle speed. A carbon-fouled sparkplug also signifies that you've been using too much oil.

Not enough oil is just as bad. Cylinder walls score because of poor lubrication, piston rings stick and bearings start to fall apart. Although lack of sufficient oil often results in engine clatter and a slowdown at high-speed throttle for no apparent reason, the safe course is not to wait for indicators.

How to mix. Only yesterday I saw an outboard owner carefully measure out the correct quantity of oil and pour it into his gas tank. Then, oh so carefully, he measured out the correct quantity of gas and poured that into his tank.

Then what? He hooked up the tank, started the engine and off he went.

That isn't what's meant by "proper mixing." Oil is heavier than gasoline and will sink to the bottom of the tank unless the two are mixed thoroughly.

When a remote gas tank is used, the proper way to do the job is to first pour the correct amount of oil into the tank and then add one gallon of gasoline.

Now, pick up the tank and shake it vigorously to mix oil and gas together. Add the remainder of the gas and follow with another period of agitation.

If you operate your engine when temperatures are below freezing, you have to be even more thorough in mixing fuel. At low temperatures, oil and gas are even harder to mix, so extreme agitation is necessary.

If your boat's equipped with a large, built-in tank, don't simply pour gas and oil into the tank and hope they mix. They won't.

Instead, pour the oil and a few gallons of gasoline into a spare remote tank and mix them up thoroughly. Then pour this small amount of mixture into the tank, followed by the remainder of the gasoline.

Some outboard owners believe that if the fuel mixture doesn't feel oily, there isn't sufficient oil in the mixture. That's not so! Although mixed together in the gas tank, oil and gas part company when they are

(Please turn to page 208)

RUSTY



TOOLS?



QUICK! Clean 'em with famous 3-IN-ONE OIL. A few drops every now and then prevent rust and tarnish. Famous for 64 years! On sale everywhere.

3-IN-ONE OIL

REGULAR • OIL SPRAY • ELECTRIC MOTOR

I-N-V-E-N-T-O-R-S

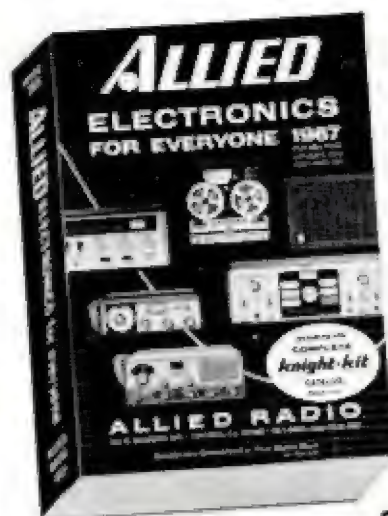
WE NEED INVENTIONS

Sell your invention for cash—need money for Patent?—Are technical problems holding you back? Universal Inventions has helped inventors all over the world—just like yourself—why not you? Inventions provide the magic spring-board to sudden riches. **REMEMBER**, we either sell your invention or pay you a cash bonus. Write for details.

UNIVERSAL INVENTIONS, Dept. 13, Marion, Ohio

FREE

NEW 514-PAGE ALLIED 1967 CATALOG



Top Savings on the best in electronics for everyone . . .

Famous Knight-Kits • Stereo Hi-Fi • Tape Recorders • CB 2-Way Gear • Walkie-Talkies • FM-AM Radios • Short Wave • Portable TV • Amateur Gear • Intercoms and PA • Automotive Electronics • Test Instruments • TV Antennas Hardware, Parts • Plus scores of Allied values!

NO MONEY DOWN!
24 months to pay with Allied Credit Fund Plan.

FREE!

ALLIED RADIO, Dept. 6-J

P.O. Box 4398, Chicago, Ill. 60680

☐ Send FREE 1967 Allied Catalog

Name _____

PLEASE PRINT

Address _____

City _____

State _____

Zip _____

EVERY CEILING YOU BEAUTIFY WITH SIMPSON TILE.....



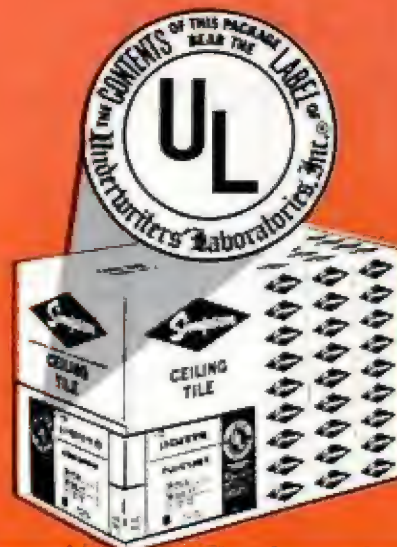
Now it costs no more to get Underwriters Laboratories rated flame spread protection on your ceilings. The UL stamp on the back of every Simpson tile assures you of this added safety performance. Don't settle for less . . . write today for the name of the Simpson dealer in your vicinity.



SIMPSON TIMBER COMPANY

2000 Washington Building
Seattle, Washington 98101

GIVES YOUR FAMILY THIS ASSURANCE OF ADDED SAFETY



FUEL MIXES

(Continued from page 206)

sprayed from the carburetor into the induction system.

At carburetor temperature, the volatility of the gas permits it to vaporize for burning. Oil, however, remains in globules, and is deposited on cylinder walls and crankcase walls. From here, it runs into the sump, where it is pumped to bearings.

So the fact that the fuel mixture doesn't feel slick shouldn't cause one bit of concern, as long as you have the right amount of oil, the right amount of gasoline.

Gasoline tips. We've spoken a great deal about oil. But what about gasoline? Use of the wrong kind can also cause problems.

No outboard manufacturer will go on record as recommending one brand of gasoline over another. The only specific recommendation given by all of them is to use a "white" unleaded gasoline if at all possible. Why? Because lead is an outboard engine's nemesis.

The development of high-compression auto engines made mandatory the addition of chemicals to gasoline to overcome knocking problems. An increase in octane rating was needed, and many gasoline refiners did this by adding tetraethyl or tetra-

methyl lead.

Lead can cause trouble in an outboard engine by forming a conductive film on the sparkplug insulator. This fouls out the plug and causes loss of engine power.

If you have to settle for a leaded fuel, use a popular brand of *regular* grade automotive gas. Do not use premium, which contains even more lead than regular.

Finally, here are a few general hints concerning gas and fuel mixture:

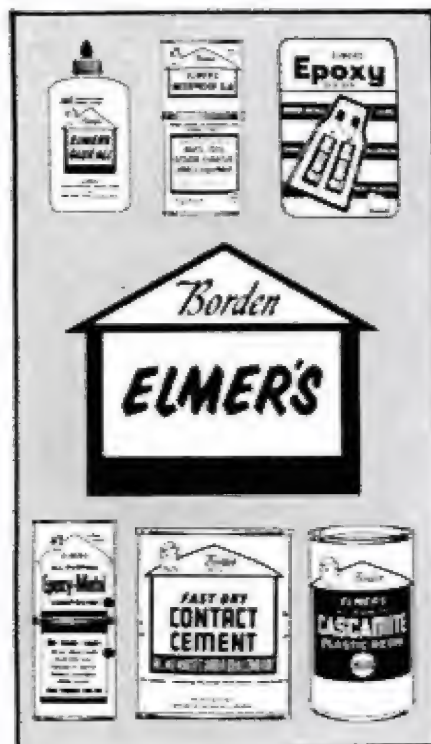
- Use a fresh fuel mixture at all times. After several months of standing in a container or a remote fuel tank, as it might over the winter, fuel ages and develops petroleum gum. Use of this fuel can cause clogging of fuel screens, carburetor orifices and valves. Dump it and mix a new batch.

- Likewise, purchasing gasoline from a service station or marina in a remote area presents the possibility of the fuel being old. Try to buy your gas from outlets with quicker fuel turnover.

- Always use a clean container when mixing fuel, and make sure that no dirt drops into it. Even a small particle can plug up carburetor passages and prevent fuel from reaching the combustion chamber. Then you have the job of trying to figure out why your outboard doesn't start, or stalls, or idles rough.

★ ★ ★

How to pick the right glue to do the job right!



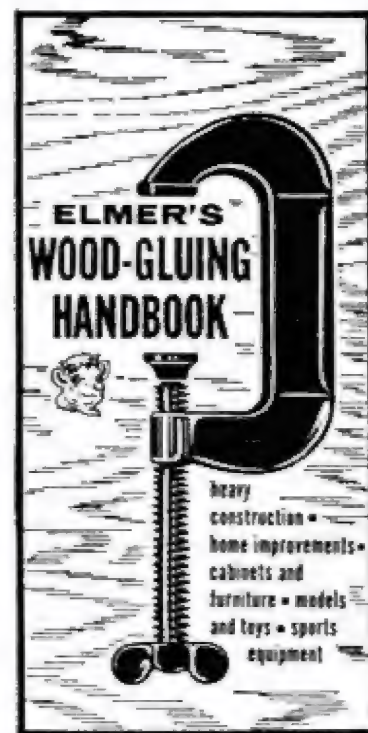
1. Look for the
name—ELMER'S

2. Send for this
FREE BOOKLET

It tells you how to match the right glue to the type of job and the kind of material...so that you get a perfect bond every time. It gives you scores of tips to make gluing faster and easier. It's yours if you'll just send a stamped, self-addressed envelope to: The Borden Chemical Company, Dept. S-4, 350 Madison Avenue, New York, N.Y. 10017.



**BORDEN
CHEMICAL**





Eleven years ago . . .

*... We guaranteed that
our fiber-glass handles
would not break, bend or
collapse in normal use.*

We still do!

**BUY THE BEST
... BUY PLUMB®**

FAYETTE R. PLUMB, INCORPORATED • PHILADELPHIA, PA. 19137

Stronger ceramics

A new process that can make ordinary ceramics eight times stronger has been developed in a University of California engineering laboratory.

In a series of tests using a compression process called "pre-stressing," scientists applied 10,000 pounds of pressure per square inch along the width and length of an ordinary brittle tile. For laboratory purposes, the force was furnished by two hydraulic jacks, each of which exerted 30 tons of pressure against the edge of the six-inch-square tile. A third jack pushing from below tested the load-bearing strength of the compressed tile.

Results: Brittle ceramics can support much heavier loads without shattering when their particles are pushed together and will not crack if suddenly heated. They can be used to make strong, lightweight, decorative, fireproof and earthquake-resistant buildings, as well as

bridges, road paving and airport runways.

Ceramics' high heat resistance already enhances its use in jet and rocket engines and space vehicles exposed to extreme temperatures during reentry into the atmosphere.

Oldest life forms

Minute forms of life existed on earth as much as three billion years ago. Tiny, bacterium-like organisms have been found preserved in black chert rock in eastern Transvaal, South Africa. Identification of these microfossils—by means of both optical and electron microscopy—was made by Drs. Elso S. Barghoorn and J. William Schopf of the department of biology and botanical museum at Harvard University.

The oldest cellular microorganisms previously discovered are the two-billion-year-old fossils found on the Gunflint Iron formation in northern Ontario.

DELUXE BATHROOM

(Continued from page 137)

Ply's own high-gloss Satinlac. (If you prefer a softer sheen, rub down the final coat with fine steel wool.) With this moisture seal, you should have no problem—unless your bathroom is the Great Dismal Swamp, without normal air circulation.

All construction involving a visible face was done with $\frac{3}{4}$ -in. G1S walnut Weldwood. Exposed edges were taped with matching Wood Trim. The window wall was covered with a sheet of $\frac{1}{4}$ -in. walnut, applied with U.S. Ply's panel adhesive—but if you want to save time, you can go to a prefinished paneling, here and on the toilet side of the stub partition. Standard black rubber baseboard contributes a finished look at the floor line and masks the wall from wet-mopping.

Back wall is coved

You'll note that the back wall between these two alcove faces is surfaced with vinyl sheeting, coved right up from the floor. This not only creates a striking effect but eliminates the bathroom's most unsanitary corner. (The wall-hung bowl makes cleaning even easier.) The flooring is Armstrong's brand-new Cambrian vinyl Corlon with Cushioncord. The latter is a foam vinyl backing that "gives" underfoot, then springs back as you lift your foot. Many flooring materials are labeled "resilient," but these new foam-layer types really are. Such resilience offers two bonuses besides foot comfort: Because it cushions impact, the sheet is protected from puncture and wear; and the foam's insulating quality creates a warmer floor—ideal for barefoot standing. The bonded-on surface vinyl features a deep pebbled texture that tends to "slip-proof" a wet floor.

Armstrong doesn't recommend do-it-yourself installation of sheet flooring—particularly of so novel a material as this, which requires two special adhesives: S-210, applied to the floor with a notched trowel, and S-70, for edge application to seal the seams. In a proper installation, the seams will be invisible.

The other installation you may wish to leave to a pro is the tiling of the tub alcove—although we presented full how-to instructions in our February, 1964, issue. For this job, we chose a light yellow tile to match the fixtures and the Micarta countertop.

In the counter construction detailed on page 133, the backsplash panel is optional. If the wall between the countertop and the recesses for the medicine cabinets is sound, you'll doubtless apply Micarta di-

rectly to the wall surface (after cutting three holes for the dispensing fixtures, as indicated). A full back has been omitted from the cabinet to facilitate the plumbing hook-up. The basins hang from special rims and require no support blocking. The countertop is made of any smooth-faced $\frac{3}{4}$ -in. panel with forward edges doubled to present greater thickness for Micarta edge-banding.

The two mirror-backed shelf shadow-boxes are easily custom-made, utilizing a standard-sized chrome-framed mirror set against back cleats and "locked" in place with the adjustable L-brackets that support the plate-glass shelves. The shadow-box above the hamper is identical to the one in the stub partition, except for its greater depth. Each 24-in. lighting fixture is simply wall-mounted so its bottom panel is flush with the top of the recess.

The old-fashioned radiator was replaced with an efficient electric wall heater (it has its own circulating fan), but if we had wished to keep steam heat, we'd have converted to one of the trim modern baseboard radiators.

The guiding principle of our whole approach was: recess for maximum space. Perhaps the most incredible aspect of our conversion is that all that glamour and all those conveniences are packed into a floor space 6-ft.-3-in. wide and 8-ft.-2½-in. long! So you needn't feel *your* present bathroom is too small for a similar treatment. To select fixtures and materials, see the directory at right. ★★★

Mud-walled village

The oldest village with mud walls still standing has been unearthed in Iran by Canadian anthropologists headed by Dr. Philip Smith of the University of Toronto. Apparently built by people of the New Stone Age nearly 10,500 years ago, the village has three or four levels, each containing the remains of successive mud-walled villages.

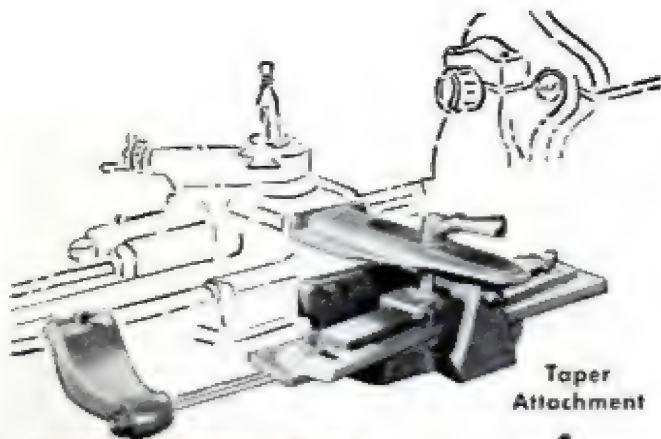
It was during this time that man first began to domesticate animals, as well as till the soil and raise his own crops—instead of gathering them from the wilderness. Proof of such activity was found in quantities of animal bones, charcoal and other debris from ancient hearth fires, scattered about the Iranian site.

The mud huts which Neolithic man fashioned were the beginnings of an architectural style that is still typical of many Middle Eastern areas. Dr. Smith hopes to return to the site and help document the gradual evolution of Middle Eastern culture from its origin in early Neolithic times to the present.

MANUFACTURERS DIRECTORY

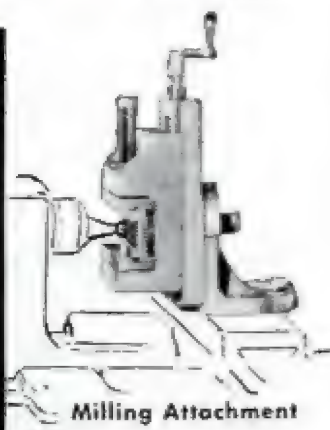
| ADDRESS | ITEM | CATALOG NUMBER | OVERALL SIZE | | | WALL OPENING | | | SUGGESTED LIST PRICE |
|--|--|---|--|-----|----|-----------------|-----|----|--|
| | | | W | H | D | W | H | D | |
| Armstrong Cork Co. Lancaster, Pa. 17604 | Cambrian Vinyl Corlon flooring | 80002 | 6-ft. width | | | — | | | \$1.35 sq. ft. installed |
| Artco Products Corp. 328 Grand Ave. Brooklyn, N. Y. 11238 | Enameled steel clothes hamper | Yellow | 19½ | 38½ | 7½ | 16¾ | 36 | 3½ | \$27.00 |
| Crane Co. 4100 S. Kedzie Ave. Chicago, Ill. | Round enameled cast iron lava- tory | April 1-294 w/8-2036A Capri Dialette fittings (2 req'd) | 18 dia., 8½ deep | | | — | | | \$57.52 ea. (Hudco frames are \$8 ea. extra) |
| | Enameled cast iron recess tub | Fairfax 2-100 w/8-1412 Criterion Dialette trim, with shower and diverter over rim spout | 5 ft. | 14 | 30 | — | | | \$174.00 |
| | Wall-hung reverse trap closet | Rexmont 3-117 w/3-886 Teleseat | Bowl projects 26¾", tank is 21" wide | | | — | | | \$113.78 (concealed hanger is \$44 extra) |
| Dremel Mfg. Co. Racine, Wis. 53403 | Electric shoe polisher | Diplomat, 771 | 15 | 6½ | 5 | — | | | \$29.95 |
| Theodore Efron Mfg. Co. 7519 S. Greenwood Ave. Chicago, Ill. 60619 | Triplex glass- door shower enclosure | Showerite 333 | For 5-ft. tub | | | — | | | \$94.95 |
| Hall-Mack Co. 1380 W. Washington Blvd. Los Angeles 7, Calif. | Concealed scale | 350 | 11¾ | 19½ | — | 10¾ | 18¼ | 4 | \$59.50 |
| | Relaxation unit | 300 | 21½ | 7½ | — | 20½ | 6¼ | 4 | \$25.50 |
| | Relaxation unit for magazines | 302 | 13¼ | 19½ | — | 12½ | 18 | 4 | \$34.50 |
| | Recessed tissue holder | 319 | 11½ | 6 | — | 10½ | 5½ | 4 | \$9.50 |
| | Retractable clothesline | 316 | 3¾ dia. 1½ | | | — | | | \$8.00 |
| Miami-Carey Div. Philip Carey Mfg. Co. Cincinnati, Ohio 45215 | Mirror-doored medicine cabi- net | Duette Windsor 2006 (2 req'd) | 30¾ | 21½ | 4¾ | 30 | 20 | 3½ | \$36 ea. |
| | 4-lamp light fixture | 436 (2 of ea. 435 req'd) | 30 | 4 | 7½ | — | | | \$16 ea. |
| | Framed mirror | 1824 (2 req'd) | 24 | 4 | 7½ | — | | | \$14.60 ea. |
| | Pivoting soap and toothbrush holder | Turnette 8090 (2 req'd) | 18½ | 24½ | — | — | | | \$19.40 ea. |
| | Soap dish and grab bar | 8004 | 7½ | 8¾ | — | 6½ | 8 | 3½ | \$22 ea. |
| | Heavy-duty grab bar "L" | 8044 | 6¼ | 6¼ | — | 5¼ | 5¼ | 2 | \$5.40 |
| | Same, straight | 8041 | 16 | 32 | — | — | | | \$18.40 |
| | Towel ladder | 6023 | 16 | — | — | — | | | \$6.61 |
| | Towel ring | 8053 (2 req'd) | 18 | 33 | — | — | | | \$24.50 |
| | Electric wall heater | 290 | — | | | 10½ 13¼ 4¼ | | | \$2.85 ea. \$45.00 |
| Syroco Syracuse, N.Y. 13201 | Battery- operated clock | 4881/1 | — | | | — | | | \$35.00 |
| U.S. Plywood Corp. 777 Third Ave. New York, N.Y. 10017 | Veneer-core walnut plywood | Weldwood 61S | 4'x8', ¼" and ¾" thick | | | — | | | ¼": \$25.60 ¾": \$32.00 |
| | Countertop laminate | Micarta 91M03 | Various panel sizes 1/16" thick | | | — | | | 60¢ sq. ft. |

NOTE: Retail prices listed above are, in many cases, supplied by the manufacturer on the basis of a national average or "suggested" list. Such prices will vary from area to area and dealer to dealer, and are offered only as a rough guide toward estimating your total expenditure.



Taper Attachment

**Get
More Work
out of
Your Lathe**



Milling Attachment



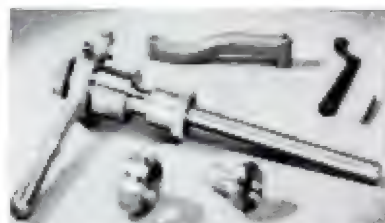
Steady Rest



External Grinder



Live Centers



Handlever Collet Attachment

Use South Bend® Attachments to...

Cut Machining Time • Simplify Difficult Jobs
Speed up Tooling • Handle More Types
of Jobs • Perform Non-lathe Operations

Write for complete information
on the largest selection of lathe attachments,
tools and accessories made.

SOUTH BEND LATHE

South Bend Lathe, South Bend, Indiana 46623

Builders of Lathes, Milling Machines,
Shapers, Drill Presses.

Up to 36 months to pay



BOND STREET

THE PIPE TOBACCO THAT STAYS LIT!

Bond Street keeps burning because of its Old English cut—a combination of flakes for even-burning and cubes for slower-burning. You'll like its aroma of fine domestic and imported tobaccos, too.

How much "cake"?

A pipe develops its flavor from its cake, but too much may actually crack the bowl. Never let the cake get thicker than a nickel; remove cake with a pipe reamer—a knife or sharp object may cut the briar.

A pipe! It's a great soother, a pleasant comforter.
BULWER-LYTON

A product of Philip Morris Inc.

Feet Hurt?

USE TRIM

TOENAIL CLIPPER

for proper toenail care.

Look for the full line of TRIM implements at your favorite store.

The W. E. Bassett Co., Derby, Conn.

NEW BOOK

ENGINE ABC's by DEAN BROWN

Written and illustrated to explain the operating principles of automotive engines plus basic carburetor and ignition systems.

**NO MATH • EASY TO READ
CUTS ALL THE TECHNICAL FOG**

Fundamentals To Guide You In Troubleshooting, Tune-ups, Or To Better Judge Repair Advice
SPECIAL SECTIONS... Explain Valves, Valve Timing, and Valve Operating Mechanism

\$295 CHECK OR M'ORDER
In Calif. Add 12¢ Tax
Postpaid. Give your Zip Code

ENGINE ABC'S
Box 653, Placentia,
California 92670

MAGNET GROUND CLAMP

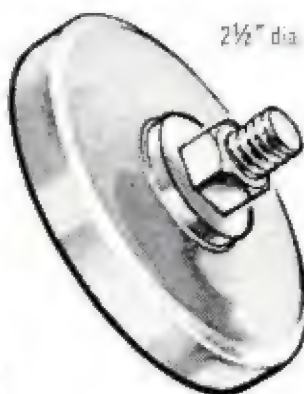
For Ground Cables To Welding Machines

Designed for easy attachment to any electric welding machine's ground cable, the Magnet Ground Clamp provides positive grounding to any shape—makes portable welders truly portable!

The Magnet Ground Clamp also serves ideally as a mount for trouble lights, farm machinery lights, machinists' indicators and instruments, etc. Send for yours now—it's only \$1.75 from

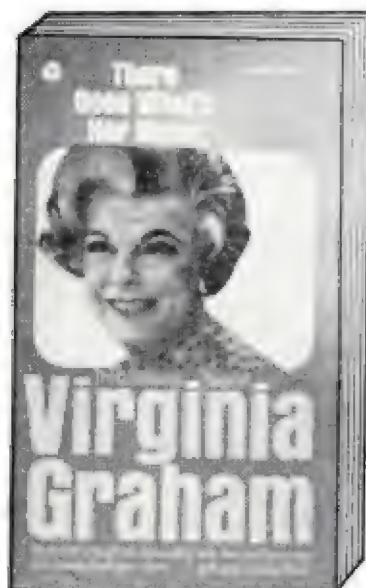
Mag-Na-Safe-Pin®

Box 65 • Medaryville, Indiana



Girl Talk!

Television's brightest personality tells her own funny-sad and moving story



Now an **Avon** Bestseller
Available Everywhere!  only **75¢**

**FREE
PLAN**

Be Your Own Boss
New Business Opportunity

FILING SAWS



Start a steady repeat CASH business in your basement or garage. Earn \$3 to \$6 an hour in your sparetime! Excellent profits in saw sharpening business! Automatic Foley Saw Filer, easy to operate, files combination saws, hand, band, and circular saws. No experience needed. H. C. Deibert wrote us: "Since I got my Foley Filer 5 years ago, I have averaged 4½ saws each day since I started." Every saw you sharpen brings you more customers. "I rented a two-car garage and have all the work I can do," writes Charles H. Smith.

FREE BOOK SHOWS YOU HOW TO START

Fact filled booklet tells you how to start a sparetime business immediately; how to get new business, how to advertise. Rush coupon now; get "Money-Making Facts" and details on Easy Payment Plan. No Salesman will call.

Send Coupon for **FREE BOOK—Money-Making Facts**

FOLEY MANUFACTURING CO.
916-6 Foley Bldg., Minneapolis, Minn. 55418
Send **FREE BOOK**—"Money-Making Facts",
and Easy Payment Plan.

Name _____

Address _____



Remove Most Finishes



...quickly,
easily,
completely with
Klean-Strip



KLEAN-STRIP Heavy-Bodied removes most finishes from most surfaces. One application strips paint away, quickly and easily. It's water-washable, and needs no neutralizing. And **KLEAN-STRIP** is the safer remover. It's non-flammable. Get **KLEAN-STRIP** at your neighborhood paint, hardware or building supply store, and see how easy paint removing can be.

For more information,
write

Klean-Strip Co., Inc.
2340 S. Lauderdale
Memphis, Tenn. 38106

**You can do it
this way...**



**or the easy way with
CON-TACT Brand
self-adhesive
plastic.**



Take the easy way to Instant Decorating, with easy-on, care-free CON-TACT® plastic! Everyone can use this self-adhesive covering—it smooths right onto almost any surface. Versatile, decorative CON-TACT plastic transforms old furniture, decorates everything from walls to window shades, and protects splash areas, because it's waterproof and washable. Lets you match up everything in your kitchen (counters, shelves, canisters)...or cover walls with woodgrain so realistic your friends will be amazed when they hear "It's really CON-TACT!" Dozens of patterns and colors, at department, variety, hardware and paint stores, supermarkets. 49¢ yd. 18" wide (slightly higher in Canada)

FREE! 90-pattern guide and decorating ideas.
Write "CON-TACT," Dept. PM 2, 1407 Broadway, New York, N.Y. 10018

Insist on quality-guaranteed **Con-Tact®**
BRAND

CON-TACT® is the registered trademark of
United Merchants and Manufacturers, Inc., for its self-adhesive plastic.

'CONFESSIONS' OF A CAR SALESMAN

(Continued from page 61)

he seemed. True, the deal was close—only a \$42 profit and a \$20 commission—but he could move to \$10 because his "cost" price quoted on the heavier tires included \$10 profit. "I figured he'd go lower, and I'd need that 10 bucks," Bob said later, adding, "If it weren't for the contest, I wouldn't have let the car out the door at that price."

Such haggling, of course, is the crux of the car-buying battle. New cars, by law, have a factory suggested, or "sticker," price posted on the window. As most seasoned buyers know, however, this price tag can be whittled down. But most don't know precisely how much, and this increases the buyer's natural distrust of the car salesman.

At our Chevy shop, the sticker price was at least \$300 above cost on compact cars and as much as \$800 over cost on larger cars. We usually would start the bidding at a \$250 to \$350 markup—well below the "sticker" price. If pressed, we eased lower. At about \$200 profit, we were "talking turkey," and a \$150 profit was considered a "break-even deal." But we were ready to sell at a still lower price during a sales contest; we needed the volume to win.

Also, our salesmen usually tried to switch a buyer into a car that was in stock instead of ordering one from the factory. Reason: A new-car sale counts for a contest only when it is actually delivered to the customer. There is often a month-long wait for factory-ordered Chevs.

Not all customers, of course, are tough bargainers. Once in a long while, a "lay-down," or inexperienced customer, walked in offering to pay the "sticker" price, or near it. He got his car with no argument. Such "barefooted pilgrims," as they are called, are rare.

The bartering and emphasis on price inevitably leads to confusion. At any dealership, the shopper is likely to be hit with a "lowball" price, an unrealistically low figure to get the buyer back. When he returns, the price will be increased but the shopper, tired of looking, may take it.

Complicating the hunt is the myriad of models, colors and optional equipment. For example, today's buyer has a choice of 375 U.S. models, up from 199 a decade ago. Our Chevy shop offered 50 different models, with a choice of 15 solid and 8 two-tone exterior colors. One booklet listed 163 options, including four types of

(Please turn to page 218)



If you use these



your hands need this

because DIF cleans hands like no soap can.

DIF is the amazing new hand cleaner you can use without water. Mechanics, painters, plumbers, printers, hobbyists and all men who use their hands, find that DIF quickly removes grease, paint, varnish, oil, ink, undercoating and most other stubborn grime that soap and water can't handle. Simply rub DIF in...wipe dirt away. Contains soothing Lanolin to comfort your hands. Available at supermarkets, hardware, paint, and variety stores.

J. Nelson Prewitt, Inc., Rochester, N.Y.

Special Offer: Send your name and address and 35¢ in coin to DIF, Dept. PM-96, P. O. Box 2861, Grand Central Sta., New York, N.Y. 10017, and we'll mail you a 2½ oz. tube of DIF Waterless Hand Cleaner.



Professional quality WOOD CARVING TOOLS

New 1966 catalog contains complete collection of professional quality wood carving and pattern making tools—chisels, gougers, knives, rifflers, etc. . . . in all sizes and shapes. Made of finest tempered W. German surgical steel for precision sharpness. Seasoned hardwood handles are lacquer soaked and fused to tool by unique inside ferrule for greater strength and long life. Tools from \$1.30. Write for FREE catalog. Dealers inquire.

BEE VEL PRODUCTS, Dept. PM-9,
451 Moss St., Burbank, Calif. 91502.

BOAT PLANS FULL SIZE PATTERNS • FRAME KITS

Over 60 sail, inboard and outboard designs . . . catamarans, houseboats, dragsters, hydros . . . "Glen L" has the most complete selection of build-it-yourself boats from an 8' dinghy to a 35' cabin cruiser. And, only "Glen L" includes written and pictorial step-by-step instructions and material listings specially prepared for amateurs with most Plans, Patterns and Frame Kits.

Send for new 80-page catalog completely illustrating the full selection of over 60 boats.

MAIL 50¢ TO:

GLEN L—9152T Rosecrans, Bellflower, Calif. 90707

Sure beats smoking!



Enjoy Copenhagen: Place a small pinch between cheek and gum. No chewing.

United States Tobacco Company



*Not made for some 4-w.ds.

AUTOMATIC HUBS for your 4-WHEEL DRIVE!

NOT EVEN A BUTTON TO PUSH on these amazing Lock-O-Matic selective drive hubs that automatically engage the front wheels in 4-w.d., automatically disengage them for 2-w.d. They stop front drive drag, save gas, gears, tires in 2-w.d.—automatically! For Lock-O-Matics—or popular Warn® Locking Hubs—see your dealer.

be happy—GO LOCK-O-MATIC!

WARN MANUFACTURING CO., INC.
9050-A Empire Way So. Seattle, Wash. 98118

Need a 7 1/2", 1 1/2 HP Saw that Tops 'em All?

Shop SHOPMATE First!



Model 1875
12 Amp 7 1/2"
Circular Saw **\$41.20**

Life Weld feature; overload clutch for burn-out protection. Visa-port lets you see blade at all times. Sawdust ejection chute, handy removable brush inspection cover. 12.0 amps.

All tools U/L Industrial Listed

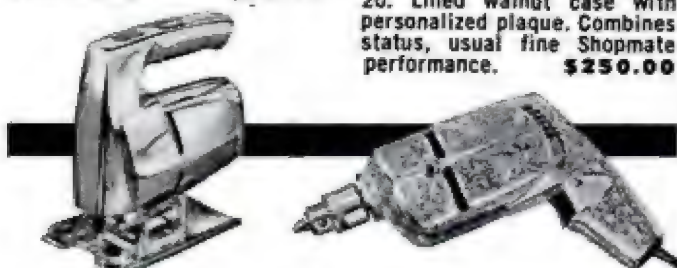


Model 1895 3.0 amps Zip-Screw Driver Takes sizes 4 to 12 slot or Phillips screws; bits, 2 finders incl. 100-to-1 gear ratio, instant reverse. 150 accessories available. **\$35.96**

Model 1810 3.0 amps Sabre Saw 30% faster—full 1" stroke, quick return cycle reciprocator. Rip guide, 3 blades, insert for splinter-free plywood cutting. **\$25.74**

Model 1860 8.0 amps 4" Belt Sander 20 sq. in. sanding surface, blower. Sands flush, even in corners. Quick release device for fast abrasive changes. All-gear drive. **\$46.36**

20th Anniversary Limited Edition 3/8" Drill Gunsmith engraved; production limited to 20. Lined walnut case with personalized plaque. Combines status, usual fine Shopmate performance. **\$250.00**



"20 Years of Power Tool Progress"

SHOPMATE

Portable Electric Tools, Inc., 1200 E. State, Geneva, Ill. 60134

'CONFESSIONS' OF A CAR SALESMAN

(Continued from page 216)

Most customers, I noticed, don't trust the car salesman. The auto sellers at our agency insisted the reputation for tricky dealing is an outdated black eye inherited from old-time used car dealers. They conceded, though, that there still are "schlock" dealers, who—as Jim, our boss, put it—"open their doors every morning looking for suckers they can take." But he believes they are becoming fewer and fewer.

At our dealership, we relied heavily on repeat customers. We rarely "lowballed" shoppers and never "bushed" a buyer by charging a higher price than agreed on.

But that didn't mean our salesmen wouldn't draw on their ingenuity to sell a buyer "today." Promising immediate delivery of cars not yet in stock, or urging buyers to break commitments to other dealers, for example, were considered fair competitive practices.

A little play-acting sometimes paid off. One young couple stopped for a price on a Caprice. The salesman knew he'd have to lower his initial offer, but wanted to make it convincing. "Let me talk to the sales manager and see if I can't get \$100 more on your car," he said.

Decision from "manager"

While the man and his wife anxiously awaited the manager's decision, the salesman strolled into the garage for a drink of water. A few minutes later, he returned with the good news that the sales manager would indeed allow \$100 more.

A good salesman has to be ready with a bag of answers. A typical customer's comment: "We've got a better price at XYZ Chevrolet. We bought our last four cars there, but haven't been satisfied with the service lately."

Our answer: "XYZ is a volume dealer and doesn't have time for the service we can give you."

A common stall from hesitant shoppers is, "I have to talk it over with my wife."

This one isn't easy to counter. Our standard line was: "That's a good idea, but why not surprise her and order the car now? Then bring her in to choose the color." (Lynn, our hard-bitten used-car man, had another answer: "Okay, and while you're getting your wife, I'll call mine and see if she'll let me sell you a car.")

"It's easy to sell a woman," claims Eddie, a 38-year-old bachelor salesman from Alabama. "Somewhere along the line you

(Please turn to page 220)

Fill Flaws In Plywood

Fill them *quick* with Plastic Wood. Handles like putty—hardens into wood. Easy to sand, paint or varnish.



For surest results always use GENUINE

PLASTIC WOOD

Handles like putty—hardens into wood!

LEARN WELDING AT HOME WE SEND YOU A WELDER

A trade with a future—In demand everywhere. We have trained thousands—Men who earn up to \$4.50 an hour. Learn Arc, Melt-Arc and Gas Welding. We supply equipment that lets you earn while you learn. Practical lessons on brand new, industrial rated machines. Both arc and flame welding. On completion the equipment is yours. Set up your own shop or work in any shop on any job. Send today for full information.

AMERICAN INSTITUTE OF ENGINEERING & TECHNOLOGY
1131 W. Fullerton Parkway, Chicago, Illinois



Electric engraver: This new compact Dremel permanently engraves names or identification numbers on steel, copper, brass, silver, aluminum, glass, wood, plastic. Handy for making tools, personal and business valuables, jewelry, industrial tools and dies—anything requiring permanent identification. Weighs only 7 ozs. Exclusive calibrated stroke adjustment regulates depth of engraving. Solid carbide engraving point. Diamond points also available. Price \$14.95 with solid carbide engraving point and storage case. See your dealer, or write for literature. *Dremel Mfg. Co., Dept. 86-I, Racine, Wis.*

4421

Pound-for-pound the world's most powerful working turbine engine and you can build it yourself!

For the past four years, Turbonique's compact, new-breed gas turbine engines have been setting fantastic power-output records everywhere.

They're being applied to hundreds of split-second response applications. Like driving the world's fastest motorcycle. Or providing a solid 500hp accessory equipment boost to a giant off-shore drilling rig.

Gas turbine experts here and in Europe have been amazed by their hp-to-weight ratio, their simplicity and reliability.

Books like *Gas Turbine*, *Automotive Industries*, *Road and Track*, *Popular Mechanics*, *Motor Boat*



This turbine kart makes speeds in excess of 125 mph. Its 105 hp Turbonique engine weighs just 40 pounds!

Complete make and build instructions for a variety of kits plus detailed engineering drawings, are included in our Technical Manual.



ing and *Popular Hot Rodding* have printed hundreds of pages to bring their readers the word about these exciting new engines.

Our new 1966 catalog describes 29 standard models with outputs from 45 to 850 hp. With all the latest performance data, application ideas, and kit and factory-assembled engine facts and prices. Send for your copy today. You'll be getting to know the hottest product in gas-turbine history.

turbonique, inc.

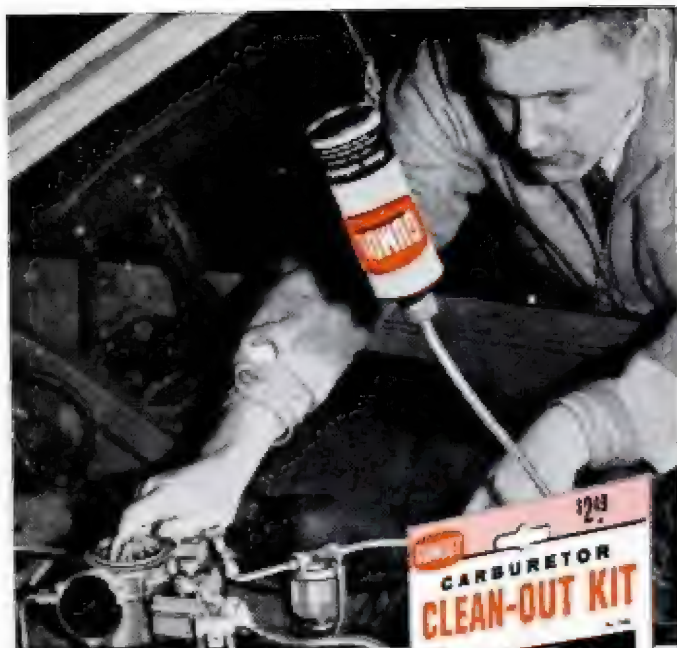
20 N. Kent St., P.O. Box 8641, Orlando, Fla. 32805

☐ \$1.00 Encl. for new 36 page catalog 66A. ☐ \$5.00 Send technical manual. ☐ \$5.00 Send 8mm x 85 ft. color demonstration film, or ☐ \$10.00 Send everything. All money refunded first order.

Name

Address

City State



**CLEAN
YOUR
CARBURETOR
QUICKLY
AND
COMPLETELY**



With GUMOUT and the easy-to-use Gumout Carburetor Clean-Out Kit, you can clean your carburetor right on the engine the fast, professional way. Or, simply add GUMOUT to your gas tank. It cleans as you drive. Get GUMOUT at your favorite service station or auto supply store.



GUMOUT

Cleveland, Ohio 44104

'CONFESSIONS' OF A CAR SALESMAN

(Continued from page 218)

make sure to compliment her. It never fails."

Most of our nine salesmen had been in the business for five to ten years, after switching from other jobs. Bob, who sold 275 cars last year and holds a college degree in merchandising from DePaul, ran his own repair shop. Mac earned his first good money in the 1930s by jumping out of planes at a county fair, and later sold house trailers. Frank, 60, turned to car selling from an office job after the company he worked for folded.

At first glance, the job would seem to have little appeal. Our salesmen worked strictly on commission. They put in 8 to 12 hours a day, six days a week (including Sundays). "I'm making more money than I ever did, but it's not worth it," complained one very busy salesman.

The salesmen were agitated by the hours spent waiting in vain for "be-backs" (shoppers who promise to return), by "flakes" (people who sign orders and never show up again) and by "nightfighters" (shoppers who show up just before evening closing time.) Another annoying customer was the "homing pigeon"—a buyer who keeps coming back to complain about squeaks and rattles that the salesman deems minor.

Pay is good

Then why sell cars? Mainly because the pay is good—our regulars earned \$9,000 to \$18,000 last year by selling 12 to 20 cars a month.

Some also said the day-to-day dealing with all types of people offered a variety few jobs can match. "Sometimes you wonder if you should get out of this crazy business," said Joe, a 19-year veteran of the auto wars. "But I have no regrets. I look forward to every customer and every month. No two are the same."

A fast learner and hard worker can climb up the pay scale fast. Big John turned to car selling in April 1965 after 15 years of office work. The first month he earned only \$134; all of last year, \$6300. But in March of this year alone he earned \$1250, and he expects to top the \$12,000 mark for the full year.

The salesmen's paychecks vary sharply. Eddie recently added up one week's commission and bonuses on six sales. The total was \$457. "Sure, it's great," he said, "but last December I didn't even get a paycheck."

At our dealership, the sales commission worked like this: A minimum, or "minnie," salesman's commission of \$20

for anything under \$150 profit: 25 percent of the first \$150 profit (\$37.50); and 35 percent of any profit over \$150.

In addition, there was a commission of \$2.50 to \$20 for financing, depending on how long it was for, and 10 percent of any premiums received on insurance offered by the dealers. Also, there was a bonus of \$100 for selling at least six cars in a two-week pay period.

At our dealership, on a sale netting \$200, with financing stretching over three years, the salesman's commission amounted to \$75.10; the average commission per sale was about \$70.

In one recent month, our dealership averaged a profit of \$177 per car sale, down from around \$200 per sale a year before; the lower "gross" reflected efforts to do well in the recent contest. (That \$177 didn't include a 2 percent "hold-back" on each car, money due the dealer but kept by the factory and paid out periodically in a lump sum; part of the "hold-back" was pure profit for the dealer, the rest went to cover such costs as "get-ready" expenses, for cleaning up a new car for delivery.

The man in charge of these complex operations was Jim, our 31-year-old part-owner. With his crew-cut hair, glasses

and slight build, he easily could be mistaken for a college student. But there was nothing part-time about his energetic handling of his business.

Jim has been with the dealership for 11 years, mostly on the business side. He was never a salesman. Early last year he bought half-ownership for \$250,000. He soon boosted sales by 55 percent to 2700 cars last year. His company earned a net profit last year of \$70,000, all of which was plowed back into the business. For himself, he cuts out an annual salary of \$26,000.

Jim considers his place a "built-in" dealership, noting that "only about 30 percent of our sales come from the showroom. The rest are built-in customers—repeat buyers and referrals." ★★

Electricity from coconuts

Coconut juice can be used to produce electricity. The juice is rich in microscopically small organisms which like all forms of life, generate tiny amounts of electricity that can be gathered in a fuel cell. Army scientists have hooked up a transistor radio to such a cell and operated it for 50 hours on the juice of one coconut.

Build Any Utility Building

better, faster, at less cost
with **homasote**

THE ALL-WEATHER
INSULATING BOARD!

Whether it's a shelter or a shed, a tree-house, or a stable or even an A-frame vacation house, building with Homasote products is quick and easy. Completely weatherproof, termite and fungus protected Homasote panels offer constant insulation and protection against the elements. Homasote panels can be used for ceiling and roof sheathing, and interior walls and ceilings. Also available with U/L Fire-Retardant rating... and with or without factory-applied colors and finishes. Saws, nails, drills and handles easier than wood. For literature and building ideas, see your local Lumber Dealer or write direct to Dept. J-8.



Special offer: Vacation Homes Plan Book. Write for your copy of "Care-Free Living." (Please enclose 25c to cover postage and handling.)

homasote Company

Trenton, N. J. 08603

6-082-1

**NEW BEAUTY
in an instant!**

BEFORE



AFTER

PLATING ENAMELS

BRASS • COPPER • CHROME

Now you can restore shabby-looking metal fixtures, hardware or accessories to their original newness . . . in minutes . . . with amazing, new DURO-PLASTIC Metallic PLATING ENAMELS! Change the original color, if you like, to complement your decorating scheme. Choice of brass, chrome or copper. Fast-drying, water-proof, rust resistant. 1 oz. bottle with brush and cap. At better hardware and paint departments.



THE WOODHILL CHEMICAL CORPORATION, Cleveland, Ohio 44128

HYDELECTRIC PAINT REMOVERS



Small size electric paint remover to remove paint from window sills, cabinets, doors and small areas. Heating element same as in electric range 350 Watts 150 Volts. Measures 11¼" long, heat shield with element 2¼" wide and 5¾" long.

No. HE95 JR

7.95



Larger model measures 13½" long overall, 1,000 Watt heating element is 3¼" wide x 6½" long. Removes house and boat paint fast.

No. HE100

12.95

Electric paint removers on sale in paint, hardware and building supply stores or sent postpaid.

Write for Free Catalog:

**HYDE
TOOLS**
SOUTHBRIDGE, MASS., U.S.A.

GUNK GP **CLEANS**
POWER MOWERS
GARAGE FLOORS
BRUSH IT ON
HOSE IT OFF
AT HARDWARE, FARM AND AUTO STORES

BILL TROUBLES?

NOBODY REFUSED UP TO \$15,000.00

Bad Credit • No Problem • Not a Loan Co.

Send your name and address for FREE application to nearest office for faster service

ATLANTIC ASSOCIATES, Dept. 54
146 Westminster St., Providence, R. I.
3312 N. Central Ave., Phoenix, Arizona

ENROLL—EARN YOUR DEGREE

of Bachelor of Bible Philosophy (B.Ph.B.), Master of Bible Philosophy (M.Ph.B.), Graduate of Bible Philosophy (G.Ph.B.), Doctor of Metaphysics (Ms.D.), or Doctor of Divinity (D.D.). Chartered by State, Correspondence Courses only. Please write for FREE BOOKLET.

AMERICAN BIBLE INSTITUTE

Dept. PM, 408A W. 75th St., Kansas City, Mo. 64114

MAKE BIG MONEY

MAKING COSTUME JEWELRY AT HOME!

Thrilling spare-time, MONEY-MAKING hobby! Make newest, beautiful jeweled earrings, necklaces, bracelets, pins, pendants, cuff links, tie clips! Quick, easy to make—easier to sell to friends, neighbors, stores, at big profit! Details FREE!

DON-BAR CO., Dept. K-196

2934 W. Fullerton Ave., Chicago, Ill. 60647



TELLS HOW TO SELL YOUR INVENTION

If you have an invention that you believe has merit, write us at once for copy of copyrighted booklet "How to Go About Selling Your Invention." We work with manufacturers, and booklet reveals present markets, qualities of a saleable invention, current royalty rates being paid by manufacturers. Booklet is FREE, is offered to encourage new ideas we might submit to manufacturers. Just send name (no drawings, please) to **Kessler Sales Corp., Dept. D-59, Fremont, Ohio 43420**

FOX MINI-BIKES

Kits to Complete

14 MODELS from \$59.50

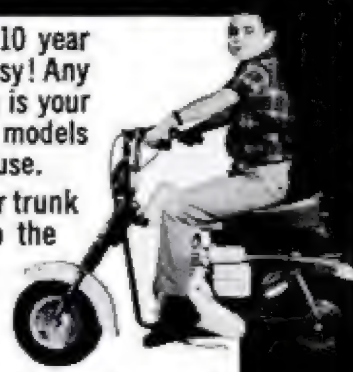
Simple enough for even 10 year olds — they're fun and easy! Any empty lot, field, or woods is your playground. And, many models are licensable for street use.

Small enough to fit in a car trunk . . . take it camping, to the cottage or beach it goes anywhere!

Literature FREE

Plans, Parts Catalog \$1

FOX CORP. Box 797PM, Janesville, Wisconsin 53545



WORLD'S FINEST CORED SOLDER

ERSIN MULTICORE 5-CORE SOLDER

BUY IT AT RADIO-TV PARTS STORES

EASY DISPENSER ONLY 69¢




FACTORY DIRECT!

MINI-BIKE KIT! \$109⁹⁵

Build your own mini-bike in about 2 hours! No welding! Speeds to 30 mph. You get:

- 2 1/2 hp 4 cycle engine
- Precision welded frame
- Complete instructions

\$10 Down \$7 Month

Assembled \$119.95

RUSH 25¢ for brochure to:

BIRD engineering, Box 427, Dept. PM9 Omaha, Nebr. 68101



PROCESS YOUR OWN 8mm B&W or COLOR HOME MOVIES

No Darkroom Required **\$17.50**

(Plus 50¢ postage & handling)

Project your movies one hour after shooting them! Simple! Economical! CINE TANK! Entire developing process, INCLUDING LOADING, is performed in daylight without ever removing film from camera spool. Plastic Cine Tank holds 30 ft. rolls of 8mm B&W or Ansacolor. Less than 20 ounces of chemical fills tank. Complete instructions included. Satisfaction guaranteed or money back!

SPECIAL! With this ad and purchase of Cine Tank—Regular \$2.25 Home Film Sitter—yours FREE!

SUPERIOR BULK FILM COMPANY

448 N. Wells St. • Dept. PM-96 • Chicago, Illinois 60610



Solves Repair Problems

Durham's fills cracks and holes in plaster, wood and tile. Won't shrink or fall out. Economical, easy to use. Big 4-lb. can, only 1.60 at lumber, paint, and hardware dealers, or shipped direct postpaid in U. S. for \$2.00. Money-back guarantee. Order now, Donald Durham Co., Box 804-T, Des Moines, Iowa.

New!

2 LB. MAGNET lifts 125 LBS.

Revolutionary new non-electric magnet has double the power of Alnico 5. Full power lasts forever without a keeper. Won't demagnetize. Pulls 125 lbs. on steel block. Wt. 2 lbs. 4" x 2 1/2" x 1" No. X 125, \$8.95 postpaid.

ALNICO 5 SPECIALS/WE PAY POSTAGE/MONEY-BACK GUARANTEE

- No. HM25 Tiny retriever assembly pulls over 25 lbs. \$3.95
- No. GP3 Electric guitar pickup rod, 3 1/2" dia. x 1" 10 for \$1.95
- No. GP5 Electric guitar pickup rod, 5 1/2" dia. x 1 1/2" 12 for \$3.95
- No. C9 Superpowered rod, rounded ends, 1 1/2" dia. x 3" \$1.25
- No. MM30 Small bar, polished, 1 1/8" x 3 1/2" x 1" 10 for \$1.00
- No. SC20 Science experiment & hobby kit, 10 assorted magnets \$2.00
- No. RM6 Flexible strip magnet, 3 1/2" thick x 5 1/2" wide 24" for \$1.00

SAMPLE PAIR SMALL BAR MAGNETS & BARGAIN CATALOG 25¢

MAGNA MAGNETICS, 7777 SUNSET BLVD., LOS ANGELES, CALIF. 90046 Dept. M

FREE

INSTRUCTION MANUAL AND IDEA CATALOG

Shows you how to make handbags, belts, billfolds, moccasins and more from genuine leather kits.

"LET'S DO LEATHERCRAFT"

Packed with money-saving, money-making tips.

ORDER TODAY!

TANDY LEATHER COMPANY

1001 Foch, Dept. TL, Fort Worth, Texas



5 YEAR GUARANTEE

10 DAY... MONEY BACK TRIAL

Best Low Cost Electric ARC WELDER You Can Buy

FOUR-WAY

Only \$14⁹⁵ POSTPAID

COMPLETE READY TO USE

SEND ONLY \$200



WELD, BRAZE, SOLDER, CUT. Tops in performance and value. Ideal gift, educational, profitable, enjoyable. No experience needed. Use 1/8" welding rods and 1/4" carbons to make or repair auto bodies fenders, trailers, boats, toys, furniture, farm equipment, garden tools, anything of metal. Operates on 110 Volt A.C. or D.C. line.

WORLD'S GREATEST WELDING VALUE. Over 500,000 in use by home owners, farmers, hobbyists, mechanics. 5-Year Unconditional Guarantee. If inoperative will repair or replace without charge. **You Get: FULL FACE SHIELD,** heavy metal cabinet, ground clamp, 12 ft. heavy cables, special combination carbon arc torch & rod holder, carbons, welding and brazing rods, flux, solder, instructions. Order on 10-DAY UNCONDITIONAL MONEY BACK TRIAL.

FREE Order from this ad and you will receive an extra \$2.00 gift of rods, flux and solder.

SEND ONLY \$2.00 and pay \$13.95 plus C.O.D. charges on delivery.

or send only \$14.95 and we will ship prepaid. **ORDER TODAY.**

FOUR-WAY WELDER CO.

DEPT. R2-J
18108. FEDERAL ST.
CHICAGO, ILL. 60616

RIDGID
the toughest
pipe wrench
in the
joint.



Choice of 10 sizes 6" through 60"

Certainly RIDGID Heavy-Duty Pipe Wrenches are tough. That's the way we build them. Then we work test them just to be doubly sure that they'll outperform and outlast all others.

Tool steel hook jaw has patented spring suspension that gives instant, slip-proof grip. Jaws can't lock . . . always release fast. Handy pipe scale, always easy adjustment and comfort-grip I-beam handle all help make a genuine RIDGID your best pipe wrench buy. Try one.

Buy a time-saving RIDGID Pipe Wrench at your Dealer's. He has a complete stock of RIDGID Work Saver Tools from The Ridge Tool Company, Elyria, Ohio 44035.

RIDGID

NEW TOOLS FOR SURGERY

(Continued from page 66)

Invented almost a decade ago, it is now performing medical jobs ranging from blasting skin cancers into oblivion to vaporizing blood clots.

Paradoxically, the laser—whose powerful beam can blind instantaneously—was first used to treat the eye. Because of disease or physical injury, the light-sensitive retina sometimes peels away from the rear wall of the eyeball. Traditional treatment consists of welding the rip back in place with scar tissue, made by focusing the beam of an arc lamp on the site. The arc lamp method is effective. It is also cumbersome, painful and relatively slow. The patient has to be anesthetized, and his pupil completely enlarged, allowing some light rays to irritate healthy areas.

Because of its intensity, a laser beam needs only 1/1000-second to cause scar formation. The duration of the burst is so short the patient feels no pain, doesn't have to be anesthetized. In addition, the laser beam can be focused to a microscopic point of light, avoiding irritation to surrounding tissue. This, plus the fact that the energy in each laser burst can be easily varied, means the surgeon can control the size and degree of scar tissue with unparalleled accuracy. Because of these advantages, the laser beam is fast becoming a common treatment for retinal detachment.

Laser blasts tumors

Cancer is another malady the laser beam has zeroed in on. At the Tufts-New England Medical Center in Boston, Dr. Paul McGuff transplanted human thyroid cancers into the cheek pouches of hamsters. When the malignancies began to grow in their new hosts, Dr. McGuff and physicist David Bushnell hit them with the searing blast of laser light. Within a month most tumors had disappeared.

Human beings are receiving similar treatment. At the Foundation for Medical Research in Pasadena, Dr. James Helsper resorted to the laser on two cancer patients when all other types of therapy had failed. Within weeks the treated growths began to shrink. Some disappeared completely. Guardedly, Dr. Helsper warns that the results are "most encouraging, but not a complete success." Research on the laser's cancer-killing effect is in full progress in several hospitals and laboratories.

Perhaps the most startling use of the laser is in microsurgery on single cells. At Philadelphia's Albert Einstein Medi-

cal College, Dr. Joseph Kochen focused a laser beam through a microscope and blasted groups of cell chromosomes, units that determine heredity. By studying changes in each cell's growth, Dr. Kochen hopes to unveil the mysteries of cellular formation.

Unlike the laser and plasma scalpel, another major medical advance doesn't generate heat at all. Instead, it detects it. The device—called the thermograph—spots minute variations in skin temperatures, opening up a new dimension in diagnostic medicine. Some consider it an advance comparable to X-rays. (See *Box Cameras Were Never Like This*, page 66, July PM.)

Thermography was born several years ago when Dr. Ray Lawson, a Montreal surgeon, discovered that cancers are slightly warmer than normal tissue.

To detect such small temperature variations, Dr. R. Bowling Barnes, considered among the world's top infrared scientists, perfected sensitive infrared cameras. Within minutes, such a camera can scan a person's body and pinpoint abnormal skin temperatures anywhere between hairline and toes. Today the thermograph is used in at least 12 major hospitals.

Cooling off ulcers

While some medical researchers are perfecting methods of using heat for man's welfare, others are concentrating on cold—with equally impressive results.

What was probably the first widespread therapy employing frigid temperatures came along in the early '60s. At that time, conventional treatment for gastric ulcers was stomach surgery. Dr. Owen Wangenstein, professor at the University of Minnesota Medical School, wondered if a less drastic and painful treatment could be devised. One day, he hit on the idea of halting the manufacture of hydrochloric acid—the prime ulcer-causing agent—by chilling the stomach.

Along with Dr. Harlan Root, Dr. Wangenstein tried out the concept on an ulcer-ridden lawyer. The team held the man's stomach temperature at 50° F. for 48 hours. A day after, acid production had ceased and the patient was relieved of his gnawing pain for the first time in years. But the relief didn't last. Within a few weeks, the stomach was making as much acid as before.

At this point, Dr. Wangenstein thought of freezing the stomach in hopes of achieving a permanent ulcer cure. After experiments on animals to determine safe freezing limits, he used the technique on a human being. In May, 1962, an ulcer pa-

(Please turn to page 226)

Let MOTOR'S Big New **1966** AUTO REPAIR MANUAL

Show You How to

FIX ANY PART OF ANY CAR



Quickly... Easily... Right!

**Shows You Where to START...
Which TOOLS to Use...
Exactly What to DO!**

1,350 pages, 3,800 pictures and diagrams
cover 2,300 models (1959-1966)... 225,000 facts
that make those "tough" repairs come easy

Motor's great new illustrated 1966 AUTO REPAIR MANUAL! Here is the "meat" of over 300 factory manuals, brought together for you in the most complete, up-to-date auto repair guide ever prepared! Here are the easy directions and "see-how" pictures that help you sail through virtually every auto repair... from a simple carburetor adjustment to a complete transmission overhaul! Here are 1,350 almost-foot-high pages that can lick your toughest problems—quickly, easily, right the first time!

Yes—fix practically any part of any car! This revised, enlarged 1966 edition immediately identifies 2,300 models (1959-1966) for you. Just look up make, model, and repair in the huge Instant-Reference Index — and go to it! Motor's Auto Repair Manual takes you all the way — shows where the trouble is, which tools to use, what to do to fix it fast. 3,800 pictures and diagrams detail the parts... clear, simple language

puts over 225,000 service and repair facts at your fingertips! And a special Trouble-Shooter section pinpoints in a flash over 2,300 causes of car trouble: transmissions, brakes, engines, electrical systems.

Saves You Time, Money, Work

You get hundreds of compact tables... over 50,000 essential specifications and dimensions... tune-up and adjustment charts... tables of measurements and clearances... overhauling and replacement facts... adjusting and servicing guidance, and much, much more!

Here is the step-by-step help every beginner needs. And here are the labor-saving methods and shortcuts that get old pros over the "tight spots" and save time and money. No wonder more than 5,000,000 copies of this great book have been sold all over the world — to garages, schools, Armed Forces!

**New
Illustrated
1966
Edition**

SEND NO MONEY

Use Manual FREE for 10 Days

Put Motor's big, new AUTO REPAIR MANUAL to work for you. See for yourself how quickly and easily it gets the work done! We'll send you this 1966 edition to use FREE for 10 days. If it doesn't start paying for itself in even this short time, return the Manual and owe nothing. Just mail the coupon below TODAY to MOTOR BOOK DEPT., 250 West 35th Street, New York, N. Y. 10019. (Schools, Bookstores: Write for discounts).

Same FREE 10-Day Trial on Motor's TRUCK REPAIR MANUAL



Covers 98% of all trucks, 1955-1966, including all new economy models. Over 2,000 illustrations; 300,000 facts. Covers all gasoline engines, plus Ford, GM, Cummins, Mack, Perkins, Caterpillar, International diesels. Over 1,000 big pages. For FREE Trial, check box in coupon.

FIX ALL THESE CARS

| | |
|-------------|----------------|
| Volkswagen | Chrysler |
| Mustang | Plymouth |
| Barracuda | Studebaker |
| Jeep | Wambler |
| Chewy II | Boone |
| Pontiac | Oldsmobile |
| Thunderbird | Ford Bronco |
| Buick | Buick Special |
| Imperval | Comet |
| Cadillac | Chevair |
| Lincoln | American |
| Dart | Oldsmobile F85 |
| Continental | Falcon |
| Mercury | Ford Fairlane |
| Ford | Lancer |
| Chrysler | Tempest |
| De Soto | Cadillac |
| Edsel | Mercury Meteor |

**FREE
10-DAY TRIAL**
Return and Pay Nothing
If Not Delighted



COMPLETE AND SIMPLE. "I always rely on my Motor Books. They're well illustrated — and complete and simple."
—Mr. Erv Jones,
Minnesota
(Garage Owner)



DEPENDS ON IT. "Motor's Auto Repair Manual is invaluable to me. I depend on it for all makes and models."
—Mr. W. W. Farlines,
Virginia
(Mechanic)

MAIL COUPON NOW FOR 10-DAY FREE TRIAL (Attach to Postcard if More Convenient)

MOTOR BOOK DEPT., Desk 619
250 West 35th Street
New York, N. Y. 10019

Rush to me at once (check box opposite books you want):

☐ **MOTOR'S New AUTO REPAIR MANUAL** If O.K., I will remit \$2 in 10 days, \$5 monthly for 2 months and a final payment of \$1.95 (plus delivery charge and sales tax, if any) one month after that. Otherwise I will return the book post-paid in 10 days.

☐ Also send me for 10-day Free Trial **MOTOR'S New TRUCK REPAIR MANUAL**. If O.K., I will remit \$11, plus delivery charge and sales tax, if any, in 10 days. Otherwise I will return the book postpaid in 10 days.

Print Name.....Age.....

Address.....

City.....

State.....

☐ Check box and save shipping charge by enclosing WITH coupon payment of \$9.95 for Auto Manual (or \$11 for Truck Manual) plus sales tax, if any. Same 10-day return-refund privilege.



NEW TOOLS FOR SURGERY

(Continued from page 224)

tient at the Minnesota hospital swallowed a small rubber balloon. Alcohol held at almost 0° F. was circulated through the balloon by means of a tube leading from the patient's mouth. Within minutes the stomach became as hard as an ice cube. It was held that way for an hour, then thawed out. The next day, the patient's pain had vanished. Several weeks later the craterlike stomach sores had healed, and eight months afterwards there was still no sign of an ulcer.

However, the therapy is regarded as "controversial" in medical circles. While many doctors are enthusiastic supporters of gastric freezing, others claim the technique's long-range effect is exaggerated and that surgery is ultimately required in many cases. Still, the method has brought relief to hundreds of ulcer victims.

Blood-chilling technique

Other developments in low temperature medicine have recently resulted in what is literally the most cold-blooded surgery on record.

Repairs to weakened or damaged brain arteries were often impossible to make since three minutes is the most time blood can be withheld from the brain without permanent damage—at normal body temperatures, anyway. For every 15° reduction in temperature, enzyme production and cell metabolism in the brain—as well as in other body tissue—falls 50 percent.

Doctors at the Mayo Clinic used this fact to devise a radically new procedure in brain surgery. First, a patient's body is cooled to 65° F. by standard methods. Next, blood from heart arteries is shunted through a cooling unit. The cool blood, chilling every cell in the body, soon reduces the patient to a state of suspended animation.

Then circulation to the brain is stopped. For up to 30 minutes damaged brain arteries are repaired, just as a plumber fixes a leaky or clogged pipe by first shutting off the main water valve. This operation, recently perfected, opens up the brain to surgery never before possible, and is now being adopted by other hospitals in the country.

Probably the most important single advance employing cold is cryosurgery—use of temperatures approaching absolute zero. This breakthrough can be traced to an accidental discovery made in 1960 by Dr. Irving Cooper, a 43-year-old surgeon at St. Barnabas Hospital in New York.

At the time, Dr. Cooper was interested in Parkinson's disease, a crippling ailment caused by the malfunction of a clump of brain cells smaller than a pea. Treatment at that time consisted of paralyzing the group of cells with alcohol, or excising it with a scalpel. But the method had a serious drawback: the surgeon often couldn't tell just how much brain tissue to inactivate or remove. Too little, and muscle rigidity continued. Too much, and the patient might become partially paralyzed.

Tip from bottle opener

The next step forward was triggered by chance. Dr. Cooper was toying with a new gadget his wife had given him. It was a carbon dioxide wine bottle opener; it's used to inject gas underneath the cork, forcing it out of the bottle. Dr. Cooper tried the release, spraying some gas on his hand. The spot grew cold. He gave it another, longer burst. The area began to feel numb.

Then the idea struck: use cold to first numb a suspected site of damaged brain cells. When the cold reached healthy tissue, it would paralyze normal body functions—but only temporarily. In this way, the surgeon could determine the boundary between malfunctioning and healthy cells. After that, quick freezing the damaged area would kill the diseased tissues.

Dr. Cooper tried out the idea. It worked with dramatic success. A typical case involved a 55-year-old insurance executive whose body had become a shaking hulk because of Parkinson's disease. In an operating room at St. Barnabas Hospital the man was given a local anesthetic and a small hole was drilled in his skull. Then, a probe—about the thickness of a knitting needle, and insulated except at the tip—was pushed into the brain until it reached the suspected area of malfunctioning cells. Liquid nitrogen was pumped into the probe and the patient, fully conscious (the brain has no pain-sensitive nerves), was asked to move his limbs one by one. The tremors had stopped; the numbing cold had knocked out the spot of tissue that had caused the muscle spasms.

At this point, Dr. Cooper lowered the probe's tip to minus 80° F. Almost instantaneously the warm tissue became a block of solid ice. About three minutes later—not enough time to damage normal tissue outside the pea-sized area—the probe was removed. Next day, the patient had normal use of his limbs. Today, such cryogenic brain operations are curing various crippling diseases.

After Dr. Cooper's pace-setting work,

cryosurgery began to be used for other ailments, too. Today, temperatures as low as minus 300° F. are employed for such tasks as killing the pituitary gland, atrophying tonsils, hardening tumors for bloodless removal and shrinking inoperable carcinomas.

For some cryogenic operations, specialized probes had to be devised. The cryostylet, developed by Dr. Charles Kelman, is one.

Freezing a cataract

Soon after Dr. Cooper's pioneering work, Dr. Kelman, head of the Cryosurgery Research Center at Manhattan Eye, Ear, and Throat Hospital, New York, realized cold might help in cataract surgery. Cataracts—a clouding of the eye lens with a toxic, opaque fluid—were usually removed by pulling them through a surgical opening in the eye with a pair of tweezers. But sometimes the thin lens membrane broke, much as a water-filled balloon might rupture if lifted with a pair of pliers. Dr. Kelman reasoned that a cryogenic probe touching the cataract would turn some of the liquid inside the lens into a small ice ball, spreading the load over a greater area and decreasing the chance of rupture.

Observing operation

Together with engineers of Frigitrionics Inc., Dr. Kelman designed the cryostylet, which cools by passing an electric current through two dissimilar metals. After experiments on animals, a project supported by the John A. Hartford Foundation, Dr. Kelman tried the cryostylet on human cataracts. Recently, I saw just how the operation is performed.

First, Dr. Kelman made a small, half-moon incision around the border of the patient's iris. An assistant handed him the cryostylet, a flat, narrow instrument about six inches long with a short, bent probe at its end. As another assistant held open the incision, Dr. Kelman touched the probe's tip—held at minus 40° F.—to the cataract.

Within seconds, a small ice ball formed at the end of the probe, which was now a frosty white from ice crystals. Slowly, Dr. Kelman pulled out the cataract. It looked like a very large globule of yellow oil. After that, closing the incision was a routine matter.

Techniques using cold and heat have so far produced dozens of medical miracles. Today, researchers continue to explore how temperature extremes can be used for man's benefit, offering a promise of even more significant advances in the years to come. ★ ★ ★

"Find-It-Yourself" Kit



Looking for bathroom fixtures, blow torches, a block & tackle, building materials... anything? Just let your fingers do the walking. Action-People do.



Bob Jones boosted his salary 300%*. Could you do the same?

A few years ago, he was just another guy. Putting in long hours in a monotonous job. Barely able to make ends meet. No prestige. And no opportunity to get ahead.

But Bob Jones had determination. He looked around and saw other men being promoted. Men with no more on the ball than he had. Except for one thing. Specialized training that made them worth more to their employers.

So then and there Bob made up his mind to get out of the rut he was in. He read an ad for International Correspondence

Schools, and mailed the coupon. (The same coupon you see at the bottom of this page.) And though he didn't know it, he'd already taken his first step up.

Soon, Bob was busy studying in his spare time. Learning new skills, and applying them in his work. It wasn't long before he was offered a better job, with a fat increase in pay. Then came other promotions—and each time, more money. Bob Jones was starting to go places. The future was bright. Today, his salary has skyrocketed 300%!

Bob Jones' success story isn't unique. It simply proves what determination can do. You can do it, too, if you're even half as interested in making good. Pick the position you want, and I.C.S. will help you prepare for it. Just as it helped Bob Jones, and hundreds of thousands of others.

Clip this coupon now. Mail it at once. You'll receive 3 valuable booklets—free. They'll prove to you that Bob Jones' success story can be yours!

*The true story of Robert E. Jones, Houston, Texas. From the success files of I.C.S.

More than 7,000,000 men and women have already enrolled with I.C.S.

Clip coupon here—and take your first big step to real success! I.C.S., Scranton, Penna. 18515

Accredited Member
National Home Study Council

INTERNATIONAL CORRESPONDENCE SCHOOLS

Dept. 3007, Scranton, Penna. 18515

(In Hawaii: P. O. Box 418, Honolulu. In Canada: I. C. S. Canadian, Ltd. In other countries: I. C. S. World, Ltd.)

Yes, I want to know about how I can get ahead through I. C. S. Rush me **FREE** Success Kit with 3 valuable booklets: "How to Succeed," opportunity booklet on the field I've checked below, actual sample I. C. S. lesson. (Special WICS booklets for women.)
CONVENIENT PAYMENT PLAN.

ARCHITECTURE and BUILDING TRADES

- ☐ Air Conditioning Maint.
- ☐ Architecture
- ☐ Arch. Drawing & Design
- ☐ Building Contractor
- ☐ Carpenter-BUILDER
- ☐ Carpentry & Millwork
- ☐ Heating & Air Conditioning with Drawing
- ☐ House Planning, Interior Design
- ☐ Reading Arch. Blueprints
- ☐ Refrigeration, Air Conditioning
- ☐ ART and DESIGN
- ☐ Commercial Art
- ☐ Interior Decorating
- ☐ Sign Painting & Design
- ☐ Sketching & Painting

AUTOMOTIVE

- ☐ Auto Mechanic-Technician
- ☐ Body Rebuilding, Refinishing
- ☐ Electrical Technician
- ☐ Engine Tune-Up
- ☐ Transmission Specialist
- ☐ BUSINESS
- ☐ Accounting (Canadian)
- ☐ Advertising
- ☐ Business Administration
- ☐ Canadian Business Courses
- ☐ Cost Accounting
- ☐ Gen'l Accounting
- ☐ Industrial Psychology
- ☐ Managing a Small Store
- ☐ Practical Accounting
- ☐ Programming for Digital Computers
- ☐ Programming the 1401
- ☐ Public Accounting
- ☐ Purchasing Agent

- ☐ Real Estate Sales
- ☐ Retail Business Mgmt.
- ☐ Salesmanship
- ☐ Sales Management
- ☐ Traffic Management
- ☐ CHEMICAL
- ☐ Analytical Chemistry
- ☐ Chem. Engineering
- ☐ Gen'l Chemistry
- ☐ Chem. Lab. Technician
- ☐ Plastics Technician
- ☐ CIVIL ENGINEERING
- ☐ Civil Engineering
- ☐ Construction Eng'n'g
- ☐ Highway Engineering
- ☐ Sewage Plant Op'r
- ☐ Structural Engineering
- ☐ Surveying & Mapping
- ☐ Water Works Operator
- ☐ DRAFTING
- ☐ Architectural
- ☐ Drafting Technology

- ☐ Electrical and Electronic
- ☐ Mechanical
- ☐ Structural
- ☐ ELECTRICAL
- ☐ Appliance Servicing
- ☐ Elec. Eng. Technician
- ☐ Ind. Elect. Technician
- ☐ Motor Repairman
- ☐ Practical Electrician
- ☐ Practical Lineman
- ☐ Reading Electrical Blueprints
- ☐ ELECTRONICS
- ☐ Electronic Computers
- ☐ Electronics Fundamentals
- ☐ Electronics Technician
- ☐ General Electronics
- ☐ Industrial Electronics
- ☐ Practical Telephony
- ☐ ENGINEERING (Professional)
- ☐ Chemical
- ☐ Civil

- ☐ Electrical
- ☐ Mechanical
- ☐ Math & Mechanics for Engineering
- ☐ HIGH SCHOOL
- ☐ High School Business
- ☐ High School (Canadian)
- ☐ High School General
- ☐ High School Math
- ☐ High School Secretarial
- ☐ High School Vocational
- ☐ College Preparatory
- ☐ LANGUAGES (Edited by Berlitz)
- ☐ French
- ☐ German
- ☐ Italian
- ☐ Spanish
- ☐ MECHANICAL and SHOP
- ☐ Gas and Electric Welding
- ☐ Industrial Engineering
- ☐ Ind. Instrumentation
- ☐ Machine Design
- ☐ Machine Shop Practice
- ☐ Quality Control

- ☐ Reading Shop Prints
- ☐ Tool Design
- ☐ SECRETARIAL
- ☐ Clerk-Typist
- ☐ Professional Secretary
- ☐ Shorthand
- ☐ Stenographic
- ☐ Typist
- ☐ STEAM and DIESEL POWER
- ☐ Power Plant Eng'n'g
- ☐ Steam Engineering
- ☐ SUPERVISION
- ☐ Foremanship-Sup'ry'n
- ☐ Personnel-Lab. Ref'n's
- ☐ TV-RADIO
- ☐ Radio & TV Servicing
- ☐ Radiotelephone License
- ☐ MISCELLANEOUS
- ☐ Textile
- ☐ Other (Please specify)

Name _____ Age _____
(Please indicate whether Mr., Miss or Mrs.)

Address _____

City _____ State _____ Zip Code _____

Occupation _____ Employed by _____ ☐ I am a member of U. S. Armed Forces.

Working Hours _____ A.M. to _____ P.M. **Special Training Programs for Industry** Send me facts about special low rates.



Perfectly Simple.

Just roll yourself a brand new room. Regal Wall Satin, the quick-to-apply... speedy-to-dry latex paint, beautifies almost any wall in one coat. Cleanup is simple, too. Just rinse roller, pan or brush in soapy water.

Simply Perfect.

Regal Wall Satin helps you create beautiful decorating effects. Its "Magic Film" assures a lovely decorator finish and rugged washability. Choose from a stunning color selection. Regal Wall Satin is superb!



Benjamin
Moore  paints

Материал, защищенный авторским правом

Winston tastes good



YOUR
like ~~a~~ cigarette
should!

© 1988 R.J. REYNOLDS TOBACCO COMPANY, WINSTON-SALEM, N.C.

Are we changing the "Winston tastes good" slogan?
Not quite.

To Winston smokers, it's still "like a cigarette should."
But to the rest of you, it's "like your cigarette should."

Get the message? Unless your cigarette is Winston,
you're missing out on the best taste in filter cigarettes.

So change to Winston and change for good...for good taste every time.

